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A COMPENDIUM OF ANATOMY, HUMAN AND COMPARATIVE.

INTENDED PRINCIPALLY FOR THE USE OF STUDENTS.

IN FOUR VOLUMES, WITH PLATES.

SIXTH EDITION, ENLARGED AND IMPROVED.

By ANDREW FYFE.

VOL. I.

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1815.

TO THE

GENTLEMEN

ATTENDING THE MEDICAL CLASSES IN THE
UNIVERSITY OF EDINBURGH,

THE

FOLLOWING VOLUMES,

MEANT TO FACILITATE THEIR PROGRESS IN THE STUDY
OF ANATOMY,

ARE DEDICATED,

With much respect,

By their most obedient,

And very humble Servant,

ANDREW FYFE.

College, *Nov.* 4. }
1815. }

ADVERTISEMENT.

The ANATOMY OF THE HUMAN BODY, in this Work, is arranged nearly after the manner of the Course of Lectures delivered by Dr Monro, Senior, and consists of the following Parts, viz.

VOLUME I.

Part I. Treats of the Bones.---II. Of the Muscles, with their Simple and Compound Actions.---III. Of the Bursæ Mucosæ, Ligaments, and other parts of the Joints.

VOLUME II.

Part IV. Treats of the Viscera, and Organs of the Senses.

VOLUME III.

Part V. Treats of the Blood-vessels.---VI. Of the Absorbent System.----VII. Of the Nerves.---VIII. Of the Glands in General.---Glossary.---Index.

VOLUME IV.

Contains the Comparative Anatomy.

Part I. Treats of Mammalia.---II. Of Birds.---III. Of Reptiles.---IV. Of Fishes.---V. Of Mollusca.---VI. Of Crustacea.---VII. Of Insects.----VIII. Of Worms.---IX. Of Zoophytes.

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PART I.

OF

THE BONES.

OF THE

BONES IN GENERAL.

OF THE COMPOSITION OF THE BONES.

The Bones are the most hard, compact, and inflexible parts of the Body.

They are numerous, and nicely adjusted to each other, to allow the Body to move readily in all directions.

They are made of a firm Substance externally, to support and give attachment to the softer parts of the Body.

They are hollow, to contain the Marrow, to render them lighter and stronger, and to extend their Surface for affording attachment to the Muscles.

Colour of the Bones.

They are more or less of a *white* or *red* colour, according to the proportions of *Earth* or *Blood* entering their composition; and are therefore whitest in the Adult, and reddest in the Child, more Earth being found in the former, and more Blood in the latter.

In living Animals, they are of a bluish colour, in consequence of the Blood contained in their small Vessels appearing through their surface.

LAMELLÆ, OR PLATES OF THE BONES.

Bones are composed of *Lamellæ*, or *Plates*, which are formed of Fibres running longitudinally, or in a radiated manner, according to the natural figure of the Bone.

The lamellated structure may be seen, by exposing them to the heat of a strong fire; or to the weather; or by boiling them under an increased pressure; or by observing their exfoliations when in the diseased state.

A late Author, SCARPA, denies the lamellated structure of the Bones, and endeavours to prove, that they have every where a Cellular texture.

The *Plates* of Bones are originally formed by the Vessels of the Periosteum Externum and Membrana Medullaris, and not, as has been supposed by some Authors, from Layers detached from the external Periosteum.

The Plates are connected by *Fibres*, which some have considered as *Claviculi* or *Nails*, and called *Perpendicular*, *Oblique*, &c. according to their different directions.

The *outer Plates* of Bones are firmly compacted, so as to appear like one solid substance.

CANCELLI OF THE BONES.

The *inner Parts* of Bones in general, whether long, round, or flat, have their Plates and Threads running in various directions, intersecting each other, and forming the *Cancelli,* or *Lattice-work*, or *Spongy Substance* of the Bones; the Cancelli every where communicating with each other.

The *Cancelli*, in the middle of long Bones, are Fibrous, and form the *Reticular Substance* which divides the Bone into large Cells.

Towards the extremities of long Bones, the Cancelli are lamellated, and much more numerous than in their middle.

Cancelli, of a similar nature to those of the long Bones, are also placed between the Tables of flat, and inner parts of round Bones.

In some of the broad Bones, however, as the Scapula, the solid parts are so much compressed, as to leave little or no room for Cancelli.

On the contrary, in the middle of the long Bones, as the Os Humeri, the *Cavities* are so large as to give to the Bone the appearance of a *hollow Cylinder*.

In some of the largest of the long Bones, as the Os Femoris, their solid sides, near their middle, are remarkably thick, and there the Cancelli are almost imperceptible; while, at their extremities, their sides are scarcely thicker than writing-paper, and the Cancelli are so numerous as to occupy the whole space between their sides.

The Cancelli of Bones are formed by the internal Plates passing inwards, and decussating each other; and in the long Bones, the sides of the Bone, in consequence of sending off the Cancelli, become gradually thinner towards its extremities, while the Cancelli in proportion become more numerous.

The thinness of the Tables of the Bones near their extremities is not in proportion to the increase of diameter, but to the quantity of Cellular Matter sent inwards.

That the Tables at the middle of the long Bones not only form the Tables at the extremities, but also the Cancelli; and that the same quantity of Osseous Matter exists at the middle as at the ends of these Bones, is proved by sawing a Bone across into portions of equal lengths, when it is found that the weight of each of the pieces is nearly the same.

The Cancelli, though extremely minute, can be seen even in the most solid parts of Bones. Some run in a longitudinal, and others in a transverse direction, communicating with the longitudinal, and becoming gradually smaller in their passage from the internal Cavity towards the outer Table of the Bones.—This may be observed by exposure to heat, or in Bones enlarged by disease. These Cells are distinguishable from the Canals for containing the Vessels, the former being irregular, and the latter cylindrical.

The Cancelli support the Membranes containing the Marrow, as the Cellular Substance does the Fat, and prevent one part of the column of Marrow from gravitating upon another in the various positions of the

Body. They also furnish a wider surface for the dispersion of the Arteries which secrete the Marrow.

BLOOD-VESSELS OF THE BONES.

Upon the *surface* of Bones there are numerous *Fissures*, for the more intimate connection of the Periosteum with the Bone, and for lodgement to Blood-vessels which pass into its substance.

Many minute *Orifices* are observed upon the surface, and particularly in the Furrows of Bones, for the transmission of Blood-vessels into their substance.

Near the middle of most of the Bones, especially the long ones, there is a *slanting Canal* for the passage of the principal Medullary Vessels, which consist of Arteries and Veins.

Numerous Orifices, some of them very considerable in size, are observed at the *extremities* of *long Bones*. Some serve for the transmission of Blood-vessels, and others for giving attachment to the Fibres of the Ligaments of the Joints.

The principal Vessels pass into the Cancelli, internal Membranes, and Marrow, and return to the solid substance of the Bone, where they meet those sent inwards from the Periosteum.

In some *flat Bones*, as those of the *Cranium*, the Bones are entirely supplied from the Vessels of the surrounding Membranes, and the Vascularity there is uniform.

In the Subject, the *Arteries* of the Bones, and sometimes the *Veins*, can be shewn by a successful Injection thrown into them; but the latter are more readily seen in Subjects that die with their Veins full of Blood; and in living Animals, when the Bones are cut across, their Vascularity appears by the Blood which oozes from their divided extremities.

The Vascularity of Bone is also shewn, by feeding an Animal for some time on the Rubia Tinctorum or Madder-root, after which the Bones are found to be completely tinged with the colouring matter of the Madder.

As a Person advances in life, the Blood-vessels of the Bones contract in their diameters, as appears from the Bones of old people having less Blood in them than those of a person at an early period of life; from Injections being thrown into the Vessels of the Bones of old persons with more difficulty than in youth; from less of the injected matter being received in the former; and from the Bones of old Animals receiving less of the tinging matter of Madder than those of young ones.

Comparative View of the Bones.

From comparing the Bones of people of different ages, it is found, that there is a constant waste and renewal of their substance; that the Bones increase in weight as a person advances to maturity; that they continue nearly of the same weight till old age begins, and then become lighter; that the specific gravity of their solid sides, on the contrary, increases by age; for then they become harder and more compact, but thinner, and have larger Cavities than the Bones of young persons.

LYMPHATICS OF THE BONES.

Bones, like other parts, have their *Lymphatics*, as appears by the absorption of Madder found deposited in the substance of the Bones of Animals receiving it with their Food; by the absorption of part of the Bone itself, when in the diseased state; by the absorption of Bone as a person advances in life; and even by Injection.

NERVES OF THE BONES.

The *Nerves* of the Bones are small, but may be observed in certain parts of them, accompanying the principal Arteries; and it is presumed they exist in all.

From the minuteness of the Nerves, and rigidity of the parts on which they are dispersed, Bones are not sensible in the sound state; and even in the diseased, the pain felt may be owing to the Membranes within them.

CHEMICAL ANALYSIS OF BONES.

The component parts of Bones are, an Earthy Matter, Cartilage, Gelatin, and Marrow, and these varying in proportion in different persons, in different Bones of the same person, and in the same Bone at different ages. The Earthy Matter, however, bears the largest proportion; but this is less in Children than in persons of more advanced life.

The Earthy Matter is obtained by Calcination, or by maceration in a diluted acid, and afterwards precipitating it, when it is found to consist chiefly of Phosphate of Lime. In either of these processes, the Bone retains its shape; but in the former it is brittle, and of a pure white colour, while in the latter it is flexible, consisting principally of Cartilaginous Matter.

By boiling in Water for a sufficient length of time, and especially if under an increased pressure, as in PAPIN's Digester, the Fat and Gelatin of Bones are dissolved and separated, and the Bone retaining its Earthy Matter, preserves also its white colour.

USE OF THE BONES.

The general *Use* of the Bones is,—to give firmness and support to the soft parts,—to defend them from external injury,—to determine their shape, size, and situation, and regulate their different motions and attitudes.

They furnish an essential part of the Organs of Locomotion, by giving attachment to the Muscles and their Tendons, and serving as Levers for these to act on.

They form in some parts Columns, which can be moved in different directions.

The extremities of the Bones give form to the Joints, and by their magnitude they render these more secure, and increase the force of the Muscles which belong to them.

The Bellies of the Muscles being generally placed upon the middle of the Bones, and the Tendons fixed to their extremities, the symmetry of the Limbs is also thereby preserved.

PERIOSTEUM.

The *Periosteum* derives its name from its furnishing a general Covering to the Bones.

In certain parts, however, it is *perforated* by Muscles, Ligaments, or Cartilages, which are fixed immediately to the surface of the Bones; and at the Joints it separates from the Bones, to give a Covering to the Capsular Ligaments.

It is *formed* of many Fibres, which, in certain parts, can be divided into Layers.

The *outer Surface* of this Membrane is connected to the surrounding parts by Cellular Substance.

The *inner Surface* is more uniform than the outer, and its Fibres run, most frequently, in the same direction with those of the subjacent Bone.

The *inner part* of the Periosteum is intimately connected to the surface of the Bones by short Fibres; and this connection is much stronger in the Child than in the Adult. Some of these Fibres may be considered as Ligamentous, but most of them are found by Injection to consist of Blood-vessels.

The Periosteum, as well as other Membranes, must be supplied with *Nerves*; but these are too minute to be readily traced.

The *Sensibility* of the Periosteum, like that of other

Membranes, is by no means acute. In the inflamed state, its sensibility is very considerable.

The *principal Uses* of this Membrane are,—to transmit the Vessels which are spread out upon its surface into the substance of the Bones;—to give attachment to Muscles;—to prevent the effects of Friction between them and the Bones;—to assist in binding the latter together;—to assist in setting limits to the increase, and to check the overgrowth of Bones;—and, in young persons, to strengthen the junction of the Bones with their Epiphyses, Cartilages, and Ligaments.

MEMBRANA MEDULLARIS.

This, improperly called *Periosteum Internum*, is an extremely fine Membrane, which lines the inside of the Bones in general, sends Processes into the solid sides of these, and is divided into numberless small parts, which also line the different Cancelli. It forms so many irregular Bags, communicating with each other, and affording a large surface for the dispersion of the secretory Vessels of the Marrow.

MARROW.

The *Marrow* may be considered as an *Appendage* to the general Corpus Adiposum, and is somewhat of the nature of Butter. It is found to be a species of fixed oil possessing peculiar properties, and is deposited by the Arteries in the Cavities of the Bones, at the same time that the rest of the Body is supplied with Fat.

The Blood-vessels of the Marrow, surrounded by the Periosteum, enter the Bones by oblique Canals, which have already been taken notice of in the description of the Bones in general.

When the Arteries have entered the Cavities of the Bones, they divide into Branches, which are spread out upon the Cancelli, Membrana Medullaris, and Marrow; from these many minute Branches are reflected outwards to the Tables of the Bones, which communicate with those sent from the inner surface of the Periosteum.

The Veins which return the Blood from the Marrow and Substance of the Bones, are collected into small Trunks, which pass out where the Arteries penetrated the Bones, and discharge their contents into the neighbouring Veins.

The greater degree of Vascularity of the Solids in Children than in Adults, is no where more conspicuous than here; for Injections which pass readily in these Vessels in Children, cannot be made to penetrate so far in those of persons more advanced in life. In consequence of which, the Marrow is found to be thin and bloody in Children, oily and thick in Adults, and watery in old people.

The Marrow, like the Fat, when viewed through a Microscope, resembles a cluster of pearls;—or it is contained in spherical Sacs, upon which Vessels are minutely dispersed, but from which no Excretory Ducts have been discovered to pass out.

It possesses little *Sensibility* in the sound state; and what it does possess is considered by the latest Authors as belonging rather to its Membranes than to the Marrow itself.

Nerves cannot be detected in the Marrow; but that this part of the Body is not without Nerves, seems to be proved by the experiments made on the Marrow when the Bones of living Animals are cut, and by the pain a person frequently suffers from Diseases within the Bones.

Marrow, according to the experiments of BERZELIUS, consists of pure Marrow, with a very small proportion of Skins of Blood-vessels, Albumen, Gelatin, Extractive Peculiar Matter, and Water.

The Marrow answers the several purposes to the Bones which the Fat does to the other Organs. According to SOEMMERRING, the use of the Marrow is to render the Bones comparatively lighter; but the real use of this Substance is probably not yet sufficiently known.

CARTILAGES.

Cartilages are of a *white Colour*, of an *elastic nature*, and much softer than Bones, in consequence of the smaller quantity of *Earth* entering their composition.

Their *Structure* is not so evidently Fibrous as that of Bones, yet, by long Maceration, or by tearing them asunder, a Fibrous disposition is perceptible.

Their *Vessels* are extremely small, though they can be readily injected in Cartilages where Bone is beginning to form. The Vessels of the Cartilages of the Joints seem entirely to exclude the red Blood. No Anatomist has been able to inject them; and Madder, mixed with the food of Animals, does not change their colour as it does that of Bones.

The existence of *Lymphatic Vessels* in them, is proved by their being absorbed during the Process of Ossification, or in certain diseases.

No *Nerves* can be traced to them; nor do they possess any sensibility in the sound state. Yet the Granulations which rise on the surface of Cartilages, after Amputation at the Joints, are very sensible.

Upon their surface there is a thin Membrane, termed *Perichondrium*, from its covering the Cartilages, which, in Cartilages supplying the place of Bone, as in those of the Ribs, or at the ends of the long Bones in Children, is a continuation of the *Periosteum*, and serves the same general purposes to Cartilage as the Periosteum does to Bone.

The Perichondrium of Cartilages which supply the place of Bone, or by their flexibility possess a degree of motion, has Blood-vessels, which, like those of the Periosteum, can be injected. But the Vessels of this Membrane belonging to other Cartilages, particularly that covering the Articular ones, cannot be injected.

Upon the Surface of Articular Cartilages, the Perichondrium is a *Reflection* of the inner surface of the Capsular Ligament, and is so very thin, and adheres so closely, as to appear like part of the Cartilage itself.

They have no internal Cavity, nor Cancelli, nor internal Membrane, for lodging Marrow; their weight is nearly a third less than that of Bone. Their Texture is less changed by acids; but a much greater proportion of them than of Bones is destroyed by the action of a strong fire. They are softened by Maceration in water; and the Articular Cartilages, by long boiling, are in a great measure dissolved.

They are found to consist chiefly of Albumen and Water, with a small proportion of Phosphate of Lime.

One set of Cartilages supply the place of Bone;—or by their flexibility, admit of a certain degree of motion, while their elasticity recovers their natural position;—as in the *Nose*, *Larynx*, *Cartilages of the Ribs*, *Cartilages supplying Brims to Cavities*, &c.

Another set, in Children, supply the place of Bone, until Bone is formed, and afford a Nidus for the Osseous Fibres to shoot in;—as in the *long Bones of Children.*

A third set, the most extensive, by the smoothness and slipperiness of their surface, allow the Bones to move readily, without any abrasion;—as in the *Abducent* or *Articular Cartilages.* By their elastic nature, they render the motions easier, and lessen the concussion in the more violent motions of the Body, as running, jumping, &c. They also prevent the inordinate growth of Bones at their articulating surfaces, and the coalescence of the Fibres of the adjoining Bones.

A fourth set supply the office both of Cartilage and Ligament, giving the elasticity of the former, and flexibility of the latter; uniting some immoveably together, and allowing to others a small degree of motion; as in the *Cartilages of the Bones of the Pelvis and Spine.*

Cartilages are divided by some Anatomists into two Sets, viz. *Temporary* and *Permanent*. The first includes those in which Bone is formed in the Child; the other consists of those of the External ear, of the Eye-lids, Nose, Larynx, and Trachea, and of the Articular, Inter-articular, and Intervertebral Cartilages.

OF THE ORIGINAL FORMATION OF BONE.

The generality of Bones are originally formed, either between Membranes, or in the Substance of Cartilages; the *Teeth* are formed in distinct Bags.

The Ossification of *broad Bones* begins, in some, as in those of the Cranium, between Membranes only, and in others, as in the Ossa Ilia, in Cartilage, and the Ossification appears in each Bone in one or more places: There the Osseous particles are so joined together, as to have a Fibrous appearance.

The Fibrous Structure is most distinctly seen in the Bones of the Cranium of a Fœtus about three months after Conception, where the beginning of the Ossification in each Bone is like a fine irregular Net-work, in the middle of which the Fibres are more closely connected than in the circumference.

In viewing the flat Bones of a Fœtus a little more advanced, the bony particles are observed to be so disposed, as to have a distinct radiated appearance.

The vacancies between the Fibres, which occasion the radiated appearance, are found by Injection to be chiefly passages for Blood-vessels.

As the Fœtus becomes larger, the Osseous Fibres increase in number, but become less apparent, the Interstices being now filled with Osseous matter, which increases in quantity till a Lamina is produced; and as the Bone continues to grow, more Laminæ are added, till the more solid part of a Bone is formed.

The Inner Layers of the Bones are observed to be more porous than the Outer, and none of them are found to have the solidity they acquire in the Adult state, till they have arrived at their full growth.

The Ossification of *long Bones* begins between the Periosteum and Membrana Medullaris, in a Jelly which afterwards hardens into Cartilage, and forms a *Central Ring*, from which the Fibres extend towards the ends of the Bone.

The Interior Lamellæ, forming the solid sides of the long Bones, are considerably shorter than the Exterior, because they pass gradually inwards to form the Cancelli, while the exterior parts are continued to the extremities of the Bones.

The Ossification of spherical-shaped Bones, as in the Wrist, begins by one Nucleus, and that of irregular-formed Bones, as in the Vertebræ, by different Nuclei; and both of these sets of Bones have their origin in Cartilage.

In proportion as Osseous matter is deposited, the Cartilage is absorbed, leaving behind it the different Cavities and Cancelli.

All the parts termed Epiphyses, likewise, have their original formation in Cartilage.

The Ossification which begins in Cartilage is considerably later than that which has its origin between Membranes,

branes, and this is at very different times in different parts of the Body; the processes being soonest completed in those Bones which cover the Organs most essential to life.

When Ossification is about to begin in a particular part, the Arteries, which were formerly of the Serous kind, become dilated, in consequence of a greater determination of Blood to them, and receive now the red Blood from which the Osseous matter is secreted. This matter retains, for some time, the form of the Vessels which give it origin, till, more Arteries being by degrees dilated, and more Osseous matter deposited, the Bone at length attains its complete form.

Some Bones are completely formed at the time of Birth, as the *small Bones of the Ear*.

The generality of Bones, however, are *incomplete* until the age of puberty, or between the fifteenth and twentieth year, and in some few instances not until a later period.

In Children, the greater number of parts in Bones are *Epiphyses* or *Appendices*, which, in Adults, become *Apophyses* or *Processes*, which spring directly from the body of the Bone.

The *Epiphyses* begin to appear after the Body of the Bone is ossified, and are themselves ossified at seven or eight years of age, though their external surface is still somewhat Cartilaginous.

In the early period of life, the Body and Ends of long Bones make *three distinct parts*, each of which has its centre of Ossification, and the parts can readily be separated by boiling, or by maceration in water.

The Epiphyses are joined to the Body of the Bone by Cartilages, which are thick in Children, but gradually become thinner, in consequence of absorption, as Ossification advances, till at last, in the Adult, the external marks of division are not to be seen; though frequently some mark of distinction may be observed in the Cancelli.

The Epiphyses belong chiefly to such Bones as are destined for much motion, and have larger diameters than the Bones to which they are fixed, in consequence of which they form a firmer Articulation, and give a more commodious attachment to the Muscles.

CLASSES OF BONES.

Bones are either Broad and Flat, Long and Round, or Spherical and Irregular.

Broad Bones have thin sides, and their Cancelli are smaller and more equal in size than in the long ones. They defend the parts they inclose, and give origin to many Muscles.

The long Bones have thick strong Walls at their middle, but become extremely thin towards their extremities; on the contrary, the Cancelli are few in number, but large in the middle of the Bone, while, near their ends, the Cells are numerous and small.

The long Bones, by their roundness and thickness at their middle, are better enabled to resist the violent pressure and injuries to which they are frequently exposed, while their extremities being large, though the quantity of matter is the same, they are less easily broken in a transverse direction. This increase of size allows also a broader Basis for the Body to rest upon, and affords more space for the attachment of Muscles and other soft parts.

The spherical irregular Bones admit of a diversity of motions, and lessen the shocks, the Joints to which they belong would otherwise frequently sustain.

PROMINENCES OF BONES.

The greater number of Bones have Prominences, termed *Processes*, projecting from them, which, when of a roundish form, the part is termed *Caput*, or Head. If the Head be flattened, it has the name of *Condyle*. A rough unequal Protuberance is styled *Tuberosity*. When a Process comes off from a Bone narrow, and is afterwards enlarged, the contracted part of it is called *Cervix*, or Neck.

A long Ridge upon a Bone is termed *Spine*. A Process terminating in a sharp point is named *Coronoid*.

Some derive their names from the Substances they are supposed to resemble,—as *Coracoid*, like a Crow's Beak,—*Styloid*, like a Pen or Pencil,—*Mastoid*, like a Nipple,—or *Anconoid*, from belonging to the Elbow,—or *Spinous*, from being sharp like a Thorn.

The rising Edges or Brims of Cavities are known by the name of *Supercilia*.

The use of the Processes is to give a more advantageous attachment to Muscles, and form Surfaces of Articulations.

CAVITIES OF BONES.

Many of the Bones have also *Cavities* or *Depressions*, which have likewise got particular names.

Deep Cavities, with large Brims, are termed *Cotyloid*, from resemblance to an ancient measure. They are called *Glenoid*, when of a superficial nature.

Small Cavities are named *Pits*, when of a roundish form, and sunk perpendicularly into the Bone; *Furrows*, when long and narrow; *Nitches*, or *Notches*, when forming breaches in the Bone; *Sinuosities*, when broad, superficial, and destitute of Brims; and *Fossæ*, when large and deep, with unequal Brims.

In the Interior parts of the Bones, when there are large Cavities with small openings, they are termed *Sinuses;*—when the openings go quite through the substance of the Bone, they are called *Foramina*, and the passage between the openings, *Canals*.

The Cavities allow the ends of Bones to move in them, lodge and protect other parts, and afford a reception or a passage to Muscles, Tendons, Vessels, Nerves, &c.

DIFFERENT KINDS

OF

CONNECTION OF BONES.

SYNARTHROSIS, Or Connection without intermediate Substance.	*Suture,* Like a Seam.	The Bones of the Cranium, and greater part of those of the Upper Jaw with each other.
	Gomphosis, Like a Nail in a Board.	The Teeth in the Alveoli.
	Schindelysis, Or *Furrowing.*	Bones of the Septum Narium to each other.
SYMPHYSIS, Or Connection by intermediate Substance.	*Synchondrosis,* Or Connection by Cartilage.	The Bodies of the Vertebræ to each other: The Ribs to the Sternum: The Ossa Innominata to the Os Sacrum, or to each other.
	Syndesmosis, Or Connection by Ligament.	The Lower Jaw and Os Hyoides to the Head: The Ribs to the Spine: The Processes of the Vertebræ, and also the Bones of the Extremities, to each other.

DIFFERENT KINDS OF MOTION.

ARTHRODIA; Where the flat ends of Bones are opposed to each other with little motion.		Between the Clavicle and Scapula. The Bones in the second row of the Carpus. The Carpus and Metacarpus. The Tibia and Fibula. The greater number of Bones in the Tarsus. The Tarsus and Metatarsus.
GINGLIMUS; The Bones mutually receiving each other, and the Ligaments admitting of a hinge-like motion.	*Angular,* One Bone, in moving, forming an angle with another.	The Lower Jaw and Head. The Joint of the Elbow. The first and second Joints of the Thumb, and second and third of the Fingers. The Joint of the Knee. The Ankle. The two last Joints of the Toes.
	Lateral or Circular.	Between the first Vertebra and Processus Dentatus of the second. Between the Radius and Ulna.
	Compound.	Between the Occipital Bone and Atlas. Between the different Vertebræ. And between the Ribs and Vertebræ.
ENARTHROSIS, Or Ball and Socket, the Ligaments allowing motion in all directions.		Inner end of the Clavicle. Head of the Os Humeri. Between the Fore-arm and Wrist, and between the two rows of the Carpal Bones. At the root of the Metacarpal Bone of the Thumb, and root of the first Phalanx of the Fingers. At the head of the Thigh-bone. Between the Astragalus and Os Naviculare, and at the root of the first Phalanx of the Toes.

OF THE SKELETON.

THOUGH the term *Skeleton* be applied to a variety of Substances, yet, in Anatomy, it is always understood to signify the Bones of Animals, connected together in their natural situation, after the soft parts of the Body in general are removed.

It is termed a *Natural Skeleton*, when the Bones are joined by their own Ligaments;

And an *Artificial Skeleton*, when joined by Wire, &c.

Small Subjects, and the Bones of those which are not fully ossified, are most conveniently prepared the first way; while the Bones of large Adult Animals are more readily cleaned when single, and are easily restored to their proper places.

In viewing the Bones in their natural situation in the Skeleton, scarcely any of them are observed to be placed in a perpendicular direction to another; yet in an erect posture, a perpendicular line from their common centre of gravity falls in the middle of their common base. On this account, the Body is found to be as firmly supported, as if the axis of all the Bones had been a straight line perpendicular to the horizon, and much greater quickness, ease, and strength, is given to the Body, in several of its most necessary motions.

The Bones are in general similar to each other in the opposite sides of the Skeleton, though in many instances there is some variation.

The Human Skeleton is generally divided into *Head*, *Trunk*, *Superior* and *Inferior Extremities*.

OF THE HEAD OR SKULL IN GENERAL.

By the Head is meant all that part of the Skeleton which is placed above the first Bone of the Neck. It therefore comprehends the Cranium and Bones of the Face.

The Cranium, or Brain-case, varies in shape in different Persons, according to the original form of the Brain upon which it is moulded.

The variety in shape not only exists in different Persons, but in the opposite sides of the same Skull, scarcely any one being found perfectly similar there, when minutely examined. The variety of shape has been supposed by some Authors to be increased by the different management of the Heads of Children at an early period of life. From this the difference of shape observed in the Skulls of people of different nations has been accounted for. The form, however, does not appear to be much affected by the management of the Head at an early period of infancy, since its characteristic marks are found to remain nearly the same, however much the customs in dress and general management may vary.

The Cranium forms a vaulted Cavity for lodging and defending the Brain, with its Membranes, Vessels, and Nerves.

The *General Figure* of the *upper* part of the Cranium is compared to that of an Egg. The medium length of it appears to be about six inches and a half, and the greatest transverse diameter, which is a little behind the External Auditory passages, about five inches.

The Cranium is of a flat form at its sides, partly by the action of the Temporal Muscles.

The flatness of this part of the Head is found to increase the sphere of vision, and to give a more advantageous situation for the Ears, that they may receive a greater quantity of sound, while they are less exposed to danger.

The *Surface* of the upper and outer part of the Cranium is smooth, where it is little affected by Muscles, and is covered by the Periosteum common to all the Bones, but in the Skull termed Pericranium.

The *under* and *outer Surface* of the Cranium is *irregular* where it gives attachment to Muscles, &c. and passage to Vessels and Nerves.

The *anterior* and *under* part of the Cranium is *hollow*, to make part of the Orbits.

The *posterior* Surface of the Cranium is *marked* by the insertion of Muscles arising from the back part of the Trunk.

The *upper* and *inner* Surface of the Cranium is *hollow*, for lodging the Brain.

The *under* and *inner* Surface of the Cranium has many *unequal Cavities*, for lodging the Lobes and Appendages of the Brain and Cerebellum, and for allowing passage to the Vessels and Nerves of the Encephalon in general.

Upon the fore part of the base of the Cranium the Anterior Lobes of the Brain rest; in the middle of the base are two deep Fossæ, for lodging the Lateral Lobes, while the Posterior Lobes and the Cerebellum occupy a still deeper Cavity behind.

Along the inner side of the Cranium are many Furrows, formed by, and for the reception of the Blood-vessels of the Dura Mater.

Upon the inner Surface of certain Crania, Sinuosities are observed, for lodging luxuriances of the Brain; and here the Cranium is sometimes so thin, as to be rendered transparent; the two Tables being then closely compacted, without any Cancelli.

In some Crania, Pits are seen of different Figures and sizes, for lodging *Granulous Bodies* on the Dura Mater, termed *Glands of* PACCHIONI; or sometimes they are occupied by the meeting of large Veins of the Dura Mater. Here also there is often a want of Cancelli.

The Bones of the Cranium are composed of two Tables, which at the upper part are nearly parallel to each other.

The two Tables have intermediate Cancelli, termed here *Diploë*, though nearly of the same nature with the Cancelli in other flat Bones.

The *External Table* of the Cranium is somewhat thicker than the *Internal*, which, from its thinness and consequent brittleness, is called *Vitrea*.

The *Diploe*, or *Cancelli*, between the Tables, are more regular in the Bones of the upper than of the under part of the Cranium, where, in several of the hard Bones, they are not observable.

The thickness of the Bones varies much in different parts of the Cranium; in a transverse section about its middle height, the Bones are about one-fifth of an inch in thickness, except at the Temples, where they are thinner, and at the Front and Occiput, where they are thicker. This thickness is understood to be in the prime of life; in youth and old age, the Bones are considerably thinner, in the former case not having attained their full growth, and in the latter, part of them having been absorbed.

In the Skulls of old Subjects, the Diploe are often so obliterated, that scarcely any vestige of them can be seen.

In certain diseased Bones, on the contrary, the Diploe are of a great thickness, while the Tables of the Skull are thin like paper.

The Cranium is generally composed of *eight Bones*: *six* of which are said to be proper to the Cranium, and *two* common to it and the Face.

The *six* proper to the Cranium are,

The *Os Frontis*, placed in the fore part of the Cranium.

The *two Ossa Parietalia*, placed in the upper and lateral parts of the Cranium.

The *two Ossa Tempora*, placed in the under and lateral parts.

The *Os Occipitis*, which forms the back, and some of the lower part of the Cranium.

The *two Bones* common to the Cranium and Face are,

The *Os Ethmoides*, placed in the fore part of the Base of the Cranium.

The *Os Sphenoides*, situated in the middle of the Base.

SUTURES.

The Bones of the Cranium have *Seams* or *Sutures* between them, which are five in number. Of these *three* are termed *True*, from having serrated appearances; and *two* are called *False* or *Squamous* Sutures, from the Bones which form them overlapping each other, as the Scales of Fishes do.

The *three True Sutures* are,

The *Coronal Suture*, placed between the Frontal and Parietal Bones, and getting its name from this being the part where the Ancients wore their *Coronæ* or Garlands. About an inch of each of its extremities wants the serrated appearance.

The *Lambdoid Suture*, situated where the Occipital joins the Parietal and Temporal Bones. It begins some way below the Vertex, or Crown of the Head, from which its two Legs extend obliquely downwards and to each side, in form of the Greek Λ.

The parts of the Lamboid Suture, placed between the Occipital and Temporal Bones, have little of the serrated appearance, and are called *Additamenta Suturæ Lambdoidalis.*

The *Sagittal Suture,* situated between the Parietal Bones, and named from being extended between the middle of the Coronal and Lambdoid Sutures, as an Arrow is between the String and Bow.

The Sagittal Suture is sometimes continued through the middle of the Frontal Bone to the Nose. This is said to be more frequent in the Female than in the Male. Upon examining a great number of Crania, the Author found it taking place in one out of nine or ten.

The *serrated appearance* of the True Sutures is seen distinctly on the outside of the Cranium only; on the inside, the Bones appear almost to be joined in straight lines.

In some Skulls, the internal Surface is found entire, while the Sutures are manifest without; the inner Plates meeting and coalescing sooner than the outer.

As a person advances in life, the True Sutures begin to be obliterated, first on the inner, then on the outer side, till in very old age not a vestige of one of them is to be seen.

The *two False,* called also *Temporal Sutures,* placed a little above the Ear, between the upper edge of the Temporal and under edge of the Parietal Bones.

Each of the Portions of the False Sutures, situated between the under and back part of the Parietal, and the upper and back part of the Temporal Bones, is called by some *Additamentum Suturæ Squamosæ,* and has in that part the true serrated appearance.

Besides the Squamous Sutures here taken notice of, it is to be observed, that the term *Squamous* is also applied to all the Sutures on which the Temporal Muscle is placed; it therefore includes part of the Coronal and Sphenoid Sutures.

Sometimes, though rarely, there is a double Squamous Suture, dividing the scaly part of the Bone into two unequal portions.

In the Sutures of the Cranium there are often Additional Bones, called *Ossa Triquetra*, from their being of a triangular form, and *Ossa* WORMIANA, from WORMIUS, who, though not the discoverer, gave a description of them.

The Ossa WORMIANA vary much in figure, size, and number, and are occasionally found in the different Sutures, though most frequently in the middle of the Lambdoid.

Wherever they occur, the Sutures surrounding them are observed to be similar to the neighbouring Sutures; of course they are equally with them distinguished from Fractures of the Skull.

Their formation is considered to be owing to an increase in the number of the points of Ossification, or to a deficiency in the Ossification of the ordinary Bones of the Cranium; in which last case, separate Ossifications begin in the unossified interstices.

Between the Bones of the Cranium and those of the Face, five Sutures are also found, and they are said to be common to these two sets of Bones. Parts, however, of these Sutures, lie only between the Bones of the Cranium. The Sutures here are, The *Ethmoid Suture*, which surrounds the Ethmoid Bone.

The *Sphenoid Suture*, which surrounds the Sphenoid Bone.

The Ethmoid and Sphenoid Sutures in some parts assist in forming other Sutures, especially the Squamous and Transverse; and in other parts, there is but one Suture common to these two Bones.

The *Transverse Suture*, which runs across the Orbits and root of the Nose, between the Frontal, Malar, Sphenoid, Ethmoid, Superior Maxillary, and Nasal Bones.

The *Zygomatic Sutures*, placed between the Zygomatic parts of the Temporal and Cheek Bones, and slanting obliquely downwards and backwards.

The advantages derived from the Cranium being formed of different Bones and Sutures are, that the Spheroidal figure is sooner completed;—that the Bones, which are at some distance from each other at birth, yield, and conduce to an easier Delivery;—that the Dura Mater, by the Sutures, has a firmer adhesion;—and that Fractures are frequently prevented from extending so far as they would do in one continued bony Substance; which last circumstance takes place in extreme old age.

OF THE SEPARATE BONES OF THE HEAD.

Os Frontis.

The principal things to be attended to in this Bone are,

The *Situation* of the Os Frontis in the fore part of the Cranium.

Its *Shape*, which has been compared to that of a Clam-shell, or to the *Concha Bivalvis*, or Cockle.

Its *external Surface* convex above, and smooth, being little impressed by muscular action.

The external and internal *Angular*, or *Orbitar Processes*, forming part of the Orbits.

The *Superciliary Arches*, or *Ridges* on which the Supercilia or Eye-brows are placed, extending between the external and internal Angular Processes on each side, and giving attachment to part of the Occipito-frontales and Corrugatores Superciliorum.

Projections, generally seen above the inner ends of the Superciliary Ridges, indicating the situation of the Cavities called *Frontal Sinuses*.

The *Nasal Process*, placed between the internal Angular Processes, and forming part of the Nose. It is thick and strong, and much serrated where it supports the Nasal Bones.

Part of the *Temporal Process*, or *Ridge*, on each side, behind the external Angular Process, which forms the boundary between the Temporal and Frontal Muscles.

The *Orbitar Processes*, or *Plates*, which, contrary to the rest of the Bone, are hollow below, and extend a considerable way back, to form the upper parts of the Orbits for lodging the Eyes and their Appendages.

They are remarkably smooth below, and are rendered so thin by the pressure of the Brain and Eye on the opposite sides, that they become transparent, and the Cancelli, especially in old people, are obliterated.

The *Sinuosity* at the upper part of the Orbit, behind the outer end of the Superciliary Ridge, on each side, for lodging the Lacrymal Gland.

Behind each internal Angular Process, a *small Pit*, to which the Cartilaginous Pulley of the Superior Oblique Muscle of the Eye is fixed.

The *Temporal Fossa*, behind the Temporal Process, for lodging part of the Muscle of that name.

The *Opening* between the Orbitar Processes, for receiving the Cribriform Plate of the Ethmoid Bone.

The *Foramen Supra-orbitarium*, a little to the inner side of the middle of each Superciliary Ridge, through which a branch of the Ocular Artery, and part of the Ophthalmic Branch of the Fifth Pair of Nerves, pass to the soft parts of the Forehead.

In some Skulls, the Vessels and Nerves are lodged in Furrows on the Surface of the Bone.

Frequently, instead of a Hole, a Notch only is seen, the Vessels and Nerves then passing over the Superciliary Ridge; or two Holes in one side, and one in the other, &c.

The *Foramina Orbitaria Interna, Anterius et Posterius*, sometimes called *Foramina Ethmoidea*, between the Orbitar Plates of the Frontal and Ethmoid Bones. They are about three-fourths of an inch distant from each other, and are occasionally found entirely in the Frontal Bone. Through the anterior, a small Twig of the first part of the Fifth Pair of Nerves, with an associate Artery from the Ocular, passes to the Nose. The Posterior transmits a Small Branch of the Ocular Artery to the same part. Besides these, there are sometimes *other* Foramina Orbitaria Interna, which also give passage to Twigs of the Ocular Artery to the Nose.

Small Perforations are found upon the under and fore part of the Frontal Bone, for the transmission of very minute Arteries or Nerves into the Sinuses, or to the Substance of the Bone.

The *concave* inner and fore part of the Os Frontis, for lodging the Anterior Lobes of the Brain.

The *convex* under parts, for supporting these Lobes, and covering the Eyes.

The *Ridges* and *Depressions* of the Orbitar Processes, marked by the convolutions of the Brain.

Small *Furrows* on the inside of the Bone, for lodging Blood-vessels of the Dura Mater.

Slight *Sinuosities*, more evident on the under than on the upper part of the Bone, occasioned by the convolutions of the anterior part of the Brain.

The *Frontal Spine*, or *Crista Interna*, in the middle of the under part of the Bone, formed by the coalescence of the inner tables, for the attachment of the Falx of the Dura Mater.

In such Skulls as have the Sagittal Suture continued to the Nose, the Frontal Spine does not appear; the inner Plates, in such cases, not having grown together to form it.

The *Frontal Furrow*, extending upwards from the Spine, for lodging the upper part of the superior Longitudinal Sinus of the Dura Mater, and for the attachment of the Falx.

The *Foramen Cæcum* at the under part of the Spine, for the reception of a Process of the Falx, and of small Blood-vessels which penetrate into the Nose, or to the substance of the Bone. Here also the superior Longitudinal Sinus takes its origin. This Hole is frequently common to the Frontal and Ethmoid Bones.

The *Frontal Sinuses*, placed behind the inner ends of the Superciliary Ridges, about an inch in height, and somewhat more than that in breadth, and, in some Skulls, forming prominences near the root of the Nose.

The *Walls* of the Sinuses, formed by a separation of the Tables of the Bone; there being no Diploe here.

The *Partition* between them placed perpendicularly, and preventing them from having any communication with each other.

Their capacities vary much in different Subjects, and they are frequently unequal in size in the same Body. In some they are wanting, which is oftener found to happen in persons having a flat Forehead, and where the Sagittal Suture is continued to the Nose. In others, they are so large as to extend from one side of the Frontal Bone to the other. In some Skulls, each of these Sinuses has partial partitions, and, in others, one Sinus occupies the place of two.

A *Communication* which they sometimes have with each other.

At the inner and under part of the internal angular Process, a small round *Passage* from each, leading into the Cavity of the anterior Ethmoid Cells, and from thence to the Nose.

The Frontal Sinuses add to the strength and melody of the Voice, by serving as a vault to resound the notes. Hence, in a stoppage of the Nose, by disease or otherwise, the Voice is rendered harsh and disagreeable.

The Frontal Bone is composed of two Tables with intermediate Cancelli, is of moderate thickness, and pretty equally dense throughout, excepting at the Orbitar Plates, which are remarkably thin.

The Frontal Bone serves to defend and support the Anterior Lobes of the Brain. It forms a considerable part of the Orbits of the Eyes, assists in forming the Septum Narium, Organ of Smelling, &c.

It gives origin to the Corrugator Supercilii, to part of the Temporalis and its Aponeurosis, and of the Orbicularis Palpebrarum. It gives Insertion to part of the Occipito-Frontalis, and to the Trochlea of the Trochlearis.

In a Fœtus of nine months, the Os Frontis is divided through its middle into two Pieces, which are incomplete at their upper and back part, where they assist in the formation of the Bregma or opening of the Head.—The Superciliary Holes and Frontal Sinuses are not yet formed, the latter not appearing till several years after Birth.

OSSA PARIETALIA.

The parts here to be attended to are,

The *situation* of the Ossa Parietalia, in the upper and lateral parts of the Cranium.

The figure of each Parietal Bone a Trapezium, or approaching that of a Square.

The *Superior*, or *Sagittal Margin*, the longest and straightest.

The *Anterior*, or *Coronal* edge, next in length.

The *Posterior*, *Occipital*, or *Lambdoid* edge, shorter.

The *Inferior*, or *Temporal*, shortest and thinnest, and in form of a ragged Arch, to be connected to the upper rounded edge of the Squamous part of the Temporal Bone.

The *three first edges* of the Bone *ragged*, where they assist in forming the true Sutures.

The *corners* of the Bone *obtuse*, excepting the inferior-anterior, which forms a kind of Process.

The *Corners* or *Angles* of the Bone are named Frontal, Sphenoidal, Occipital, and Mastoid, according to their situations.

The external Surface of the Bone *convex* and *smooth*, having no Muscles fixed to it but the Temporal.

The *Transverse arched Ridge*, or *Line*, frequently of a whiter colour than the rest of the Bone, placed externally a little below its middle height, for the origin of the Temporal Muscle.

The *radiated Furrows* at the under part of the Bone, formed by the Fibres of the Temporal Muscle.

Near the semicircular edge, many inequalities, which join similar inequalities on the inside of the Temporal Bone, to form the Squamous Suture.

The *Foramen Parietale*, near the upper and back part of the Bone, for the transmission of a Vein, which passes obliquely from the Integuments of the Head to the superior longitudinal Sinus; and sometimes of a small Branch from the Temporal or the Occipital Artery, to the Falx of the Dura Mater.

In several Skulls, one of the Parietal Holes is wanting; in some, two are found in one side; in others, none in either.

The internal *concave* surface of the Bone.

The *Furrows* made by the Blood-vessels of the Dura Mater; the principal of which begin by a Trunk, termed *Meningea Media*, at the under and fore part of the Bone, where frequently a real Canal is formed, which ought to be attended to by Surgeons in the operation of the Trepan over this part.

In their progress upwards, the Furrows divide into many Branches, and frequently small passages are seen running from these into the Diploe.

The *depression* at the upper edge of the Bone, for the attachment of the upper part of the Falx, and lodgement of the superior longitudinal Sinus. This is most distinctly seen when the Bones are conjoined.

The depression for the longitudinal Sinus, like the Sinus itself, becomes larger in its course backwards; and frequently it is larger in one Bone than the other.

The *Fossa* at the under and back part of the Bone, for lodging a small part of the lateral Sinus.

Numerous, though slight *depressions*, found on the inside of the Bone, especially below, occasioned by the prominences of the Brain.

Near the attachment of the Falx are observed, in many Skulls, *Pits*, varying in size and number, for lodging the Glands of PACCHIONI.

The Parietal Bones have the two Tables and Diploe the completest, and are the most equal and smooth of any of the Cranium. They serve as Walls to protect the upper and lateral parts of the Brain, and give origin to part of the Temporal Muscles and their Aponeuroses.

The *connection* of the Parietal Bones to the Os Frontis by the Coronal, and to each other by the Sagittal Suture.

In the Fœtus, the sides of the Parietal Bones are incomplete, and there is no Parietal Hole. Between the Parietal Bones and the middle of the divided Os Frontis, there is a large Interstice, termed, in common language, *Opening of the Head*, and by Anatomists, *Bregma*, *Fons*, vel *Fontanella*, from its being supposed by the Ancients, that through it the superfluous Humours of the Brain are evacuated.

The Bregma is occupied by a strong Ligamentous Membrane, which adheres firmly to the ragged edges of the Bones, and is lined within by the Dura Mater, and covered externally by the Pericranium.

The whole of the Ligamentous Membrane is generally absorbed, and the Bregma filled up with Osseous Matter, by two, though sometimes not till near seven years of age. The Bregma has sometimes, though very rarely, been found open in the Adult.

OS OCCIPITIS.

Here attend to,

The *situation* of the Occipital Bone in the back and under part of the Cranium.

Its *rhomboid* figure, with the angle above generally a little rounded.

The two lateral *Angles* obtuse.

The external surface *convex*, and *smooth* at the upper part.

The *large rough Arched Ridge*, or *Transverse Arch*, or *Linea Semicircularis*, running across the Bone, near the middle of the convex surface, to the middle of which the Trapezii Muscles are fixed; the outer and upper parts giving origin to the Occipito-frontalis, and the outer and under, insertion to part of the Sterno-mastoideus.

The *smaller Arch*, half-way between the former and the passage termed *Foramen Magnum*.

The *depressions* between the middle of the large and small Arches, for the insertion of the Complexi Muscles.

The *impressions* between the Arches and the Temporal Bones, for the attachment of the Splenii.

Cavities between the smaller Arch and the Foramen Magnum, for the reception of the Recti Minores, and impressions made more externally by the Recti Majores and Obliqui Superiores.

The *perpendicular Spine*, of inconsiderable size, running through the middle of the two Arches, and separating the Muscles of the opposite sides.

In some strongly-marked Skulls, the upper end of this Spine is so prominent, as to form an external protuberance, or *Spinous Process.*

The *unequal edges* of the Foramen Magnum, for the insertion of the Ligaments, by which the Head is fixed to the Vertebræ of the Neck.

The *inferior Angle*, contrary to the rest of the Bone, flattened and stretched forwards in form of a wedge; hence called *Cuneiform*, or, from its situation, *Basilar Process.*

The *unequal Surface* of the Cuneiform Process, for the attachment of the Recti Anteriores.

The *Condyles* placed at the base of the Cuneiform Process, and at the fore and lateral parts of the Foramen Magnum, for the articulation with the Atlas or first Vertebra of the Neck.

The *oval form* and smooth Cartilaginous surface of the Condyles, corresponding with the superior articulating Processes of the Atlas.

The Condyles run obliquely forwards and inwards, and are deepest at their inner parts; in consequence of which they are prevented from sliding to either side out of the Cavities of the Atlas.

In some Subjects, each of the Condyles is more or less divided transversely, giving the appearance of two Prominences.

Round their roots, the surface is unequal, for the attachment of the Capsular Ligaments connecting this Bone to the first one of the Neck.

The *rough Prominences* at the outer sides of the Condyles, for the insertion of the Recti Capitis Laterales; and, anterior to these Prominences, the Semilunar Notches, or Jugular Fossæ, which form part of the Holes common to the Temporal and Occipital Bones.

The Flexion and Extension of the Head are performed at the Condyles, but they are found to be placed behind its centre of gravity, which affords space for the Mouth, Throat, &c.; and the Head is prevented from falling forwards by the constant action of the strong Extensor Muscles, placed on the back part of the Neck.

The *internal Surface* of the Bone *hollow*, for containing the back part of the Brain.

The *Cruciform Spine* of the inner side, formed by two Ridges, the one placed perpendicularly in the middle of the Bone, the other crossing the first in a horizontal direction.

The *Internal Occipital Protuberance*, at the middle of the Cruciform Spine, where the longitudinal Sinus ends in the two lateral Sinuses.

The *upper Limb* of the perpendicular Spine *hollow* in the middle, or frequently at one side, and that commonly the right one, for the reception of the superior longitudinal Sinus, and the attachment of the Falx.

The *lateral Limbs*, placed opposite to the great external arched Ridge, and *hollow* in the middle, for containing the lateral Sinuses, and giving attachment to the Tentorium Duræ Matris.

The hollow in one of the lateral Limbs, and more especially the right one, is frequently the continuation of that made in the perpendicular Spine by the longitudinal Sinus, and therefore is often larger than the other, which, in such cases, is occupied by a continuation of the Vein termed *Torcular* HEROPHILI.

The *lower Limb* of the perpendicular Spine short, and sometimes double, for the attachment of the Falx Minor; sometimes it is hollow, for the reception of an Occipital Sinus.

The *Cerebral Fossæ* at the sides of the upper Limb, for containing the posterior Lobes of the Cerebrum.

The *Fossæ* at the sides of the lower Limb, for containing the Cerebellum.

Anterior to the Fossæ for lodging the Cerebellum, and a little to the outer side of the Foramen Magnum, *two Cavities* for receiving the lateral Sinuses, previous to their passing through the Base of the Cranium.

The *concave surface* of the Cuneiform Process, for receiving the Medulla Oblongata, Basilar Artery, and Accessory Nerves.

The *depressions* at each side of the Cuneiform Process, where the inferior Petrosal Sinuses are placed.

The *Foramen Magnum Occipitis*, behind the Basilar Process, and between the Condyles, for the passage of the Medulla Oblongata, and its investing Membranes, with the Vertebral Blood-vessels, and Accessory Nerves.

The Foramen Magnum, of a *rhomboid*, or at least *oval* form, with the short diameter placed transversely, corresponding with the shape of the Spinal Marrow, by which it is chiefly occupied.

The *superior* or *anterior Condyloid Foramina*, at the sides of the Foramen Magnum, and immediately over the Condyles, for the passage of the ninth pair of Nerves.

The *posterior Condyloid Foramina*, at the back part of the root of the Condyles, for the passage of Veins from the Occiput, or from the deep parts of the Neck, into the lateral Sinuses, near their terminations.

Frequently one of the posterior Condyloid Foramina is wanting; sometimes both, when the Veins pass through the Foramen Magnum.

Besides the Holes above taken notice of, others are often found, near the edges of the Bone, for the transmission of Veins, the number and size of which are uncertain.

This Bone is among the thickest of the Cranium, though very unequal; being thick and strong above, where it is little impressed by Muscles, and so thin below, where it is pressed by the weight of the Cerebellum internally, and affected by the action of the Muscles externally, as to be in many Skulls rendered transparent. But the thick Muscles and strong Spines and Protuberances of the Bone assist greatly in preventing injuries from happening here.

The *connection* of the Bone to the Ossa Parietalia, by the Lambdoid Suture.

The Occipital Bone protects the under and back part of the Brain, gives origin to the Occipito-frontalis, to part of the Trapezius, Constrictores Pharyngis Superior et Inferior; insertion to the Recti Capitis Anticus Major et Minor, Rectus Capitis Lateralis, Complexus, Recti Capitis Posticus Major et Minor, Obliquus Capitis

pitis Superior, and to part of the Sterno-cleido-mastoideus and Splenius.

In the Fœtus, the Occipital Bone is divided into *four pieces*, viz. the Occipital, two Lateral or Condyloid, and the Basilar; the first, which is by much the largest, forms all the part of the Bone above the Foramen Magnum; the second and third are placed at the sides of that Foramen, and constitute almost the whole of the Condyles; and the fourth forms the Cuneiform Process.

Ossa Temporum.

In these we observe,

The *situation* of each Temporal Bone in the under and lateral part of the Cranium.

The *Squamous Plate*, which forms a part of the Temple, and gives origin to a portion of the Temporal Muscle.

The Squamous Plate appearing equal and smooth externally, with a thin semicircular edge above, which, by overlapping the under edge of the Parietal Bone, gives name to this Process.

The *Mastoid* or *Mammillary Process*, at the under and back part of the Bone, of various form and size, giving insertion to strong Muscles, particularly the Sterno-mastoid; and containing Cells which communicate with each other, and with the Cavity of the Ear called *Tympanum*.

The *Petrous Process*, remarkably hard, very unequal, and of an oblong form, but becoming smaller in its progress; placed at the base of the Bone, from which it runs obliquely forward and inwards, and contains the internal Organ of Hearing, to be afterwards described.

The *Zygomatic Process*, running almost horizontally from the under and fore part of the Squamous Plate, at first large, then curved, to join the Os Malæ; forming a Zygoma or Arch, on the inner side of which the Temporal Muscle passes to the Lower Jaw, while its edges give attachment to part of the Temporal and Masseter Muscles, and to the Aponeurosis Temporalis.

A *Tubercle* of an oblong form at the root of this Process, covered with a smooth Cartilage, making part of the Articulation of the Lower Jaw.

The *Styloid* or *Pencil-like Process*, placed at the under part of the root of the Pars Petrosa, and going obliquely downwards and forwards, to give origin to Muscles which borrow part of their name from it, and belong to the Tongue and Throat.

It is generally about an inch in length, though sometimes much longer, and is remarkably slender. It is frequently, even in Adults, not entirely ossified, and is then apt to drop off in macerating the Bones.

The *Vaginal Process*, of an inconsiderable size, surrounding the root of the Styloid Process, and deepest at its fore part.

The *Semicircular Ridge*, at the under part of the external Meatus; sometimes also considered as a Process, and called *Auditory*, for the connection of the Cartilage of the Ear.

The *Mastoid Groove* at the inner part of the root of the Mastoid Process, giving origin to the Digastric

Muscle; and a little anterior to this another Groove, in which the Occipital Artery runs.

The *Glenoid* or *Articular Cavity*, placed obliquely behind the root of the Zygoma, of an oblong or somewhat oval form, of great size, and lined with Cartilage, for the Articulation of the Lower Jaw.

The *Glenoid Fissure*, at the back part of this Cavity, and between it and the Pars Petrosa, and also between the Pars Petrosa and Sphenoid Bone, for the attachment of part of the Capsular Ligament of the Articulation of the Lower Jaw.

A *Depression* between the Glenoid Fissure and Styloid Process, for lodging a portion of the Parotid Gland.

The *Thimble-like Cavity*, or *Jugular Fossa*, at the inner side of the root of the Styloid Process, and under and back part of the Pars Petrosa, for lodging the top of the internal Jugular Vein.

This Cavity is frequently larger in the one side of the Head than the other, corresponding with the size of the Vein which goes through it.

Between the roots of the Squamous and Zygomatic Processes, a *Cavity* for lodging part of the Temporal Muscle.

The *Meatus Auditorius Externus*,—a large Canal between the Mastoid and Zygomatic Processes, leading inwards and forwards to the Organ of Hearing.

Around the external Meatus, a rough Surface, for the connection of the Cartilages and Ligaments of the Ear.

The *Foramen Stylo-mastoideum*, or *Aqueduct of* FALLOPIUS.

LOPIUS, between the Styloid and Mastoid Processes, and at the root of the Pars Petrosa, for the transmission of the Portio Dura of the Seventh Pair of Nerves.

The *Foramen Caroticum*, vel *Canalis Caroticus*, at the inner and fore part of the Jugular Fossa, and also before and at the inside of the Styloid Process, leading upwards, then forwards, through the Pars Petrosa, for the transmission of the internal Carotid Artery to, and of the Great Sympathetic Nerve from, the Brain.

In the upper and back part of the Canal, one, sometimes two, minute Holes are observed, through which the internal Carotid Artery sends one or two Twigs to the Tympanum.

The *Iter a Palato ad Aurem*, or EUSTACHIAN *Tube*, between the Fissure for the Capsular Ligament of the Lower Jaw, and the passage of the internal Carotid Artery, and under the contiguous parts of the Spinous Process of the Sphenoid Bone and Pars Petrosa, extending outwards and backwards in a horizontal direction, till it terminates in the Tympanum.

In the Subject, it is formed, by the addition of Cartilage and Ligament, into a trumpet-like Tube, which is continued forwards and inwards to the back part of the Nostril, and conveys air from the Nose to the Tympanum of the Ear.

On the external side of the Osseous part of the EUSTACHIAN Tube, and at the top of the Glenoid Fissure, is the course of the Nerve termed *Chorda Tympani*.

The *Foramen Mastoideum*, occasionally found at the back part of the Mastoid Process, or in the Lambdoid

Suture. When present, it sometimes transmits an Artery to the Dura Mater, but more commonly a Vein from the Integuments of the Head to the Lateral Sinus.

Sometimes two or three Foramina Mastoidea are observed, serving the same purpose with that already noticed; but these, like all the other passages for Veins leading into the Sinuses, are very uncertain.

The *upper* and *inner Edge* of the Squamous Plate, formed into *Ridges* and *Furrows*, where it is connected with the Parietal Bone, and the fore part of this Plate irregular, where it joins the Sphenoid Bone.

The *inner Surface* of the Squamous Plate, *unequal* where it is marked by the Convolutions of the middle part of the Brain, and by the Arteries of the Dura Mater.

The *Pars Petrosa*, vel *Pyramis Trigona*, as seen within the Cranium, of great size, running forwards and inwards, with a sharp angle above, and dividing the Bone into two flat sides; one facing obliquely forwards and outwards, and the other as much backwards and inwards.

The *anterior* and *outer Surface* of the Pars Petrosa opposed to the lateral Lobes of the Brain.

The *posterior* and *inner Surface* of the Pars Petrosa opposed to the Cerebellum.

The *Ridge* or *Angle* between the two Surfaces of the Pars Petrosa, for the attachment of the Tentorium Duræ Matris.

A *Groove* frequently found upon the Ridge of the Pars Petrosa, for lodging the superior Petrosal Sinus.

A *curved Fossa*, at the root of the posterior Surface of the Pars Petrosa, and opposite to the Mastoid Process, for lodging the Lateral Sinus, where it turns downwards to go out of the Cranium. In this Fossa the passage is observed which corresponds with the Foramen Mastoideum.

This Cavity is frequently larger in one Temporal Bone than in the other, which happens in cases when the Lateral Sinuses are of unequal size.

The *Meatus Auditorius Internus*, vel *Foramen Auditivum*, passing outwards and backwards, in the posterior Surface of the Pars Petrosa, for the passage of the Seventh Pair of Nerves, and the principal Artery belonging to the Inner Ear.

In the bottom of this passage, there are many Foramina; one above, more conspicuous than the rest, is the beginning of the passage for the Portio Dura of the Seventh Pair of Nerves. The others are the Passages of the Branches of the Portio Mollis of that Nerve.

Some way below the Meatus Internus, is the opening of the Passage termed, by COTUNNIUS, *Aquæductus Cochleæ;* and near the same distance behind the Meatus, and on the same side of the Bone, is the mouth of the *Aquæductus Vestibuli.*

The *Foramen Innominatum*, near the middle of the Anterior Surface of the Pars Petrosa, and leading backwards, for the passage of the VIDIAN Nerve, which is reflected from the Second Branch of the Fifth, to the Portio Dura of the Seventh Pair.

The Orifice of the Canalis Caroticus appearing at the outer and fore part of the Pars Petrosa.

The *Foramen Jugulare*, vel *Foramen Lacerum Posterius*, or *Hole* common to the Pars Petrosa and Cuneiform Process of the Occipital Bone, for the passage of the Lateral Sinus, the Eighth Pair, and Accessory Nerves.

The Nerves pass through the fore part of the Hole, and are separated from the Sinus by a Process of the Dura Mater, stretched between two small Processes of these Bones. In some Skulls, an Osseous Partition separates the Nerves from the Sinus.

The Squamous part of the Temporal Bone is thin, but equal, while the Pars Petrosa is thick and strong, but irregular, having within it several Cavities, Processes, and Bones, which belong to the Organ of Hearing.

The *connection* of the Bone, at its upper curved Edge, to the Parietal Bone by the Squamous Suture.

To the under and back part of the Parietal Bone, by the Additamentum Suturæ Squamosæ.

To the Occipital Bone, by the Additamentum Suturæ Lambdoidalis.

The Temporal Bone protects the inferior and lateral parts of the Brain, and contains the Internal Organ of Hearing.

It gives origin to the Digastricus, Stylo-hyoideus, Stylo-glossus, Stylo-pharyngis, Levator Palati, Anterior Auris, Retrahentes Aurem, and Stapedius, to part of the Temporalis and its Aponeurosis, Constrictor Pharyngis Superior, and Masseter; insertion to the Trachelo-mastoideus, and to part of the Sterno-mastoideus and Splenius.

In a Fœtus, the Squamous part of the Bone is separated from the Petrous by a Fissure; there is no appearance of Mastoid or Styloid Process; and instead of an Osseous Meatus Externus, there is only a Ring of Bone, in which the Membrana Tympani is fixed.

OS ETHMOIDES.

Observe here,

The *situation* of the Ethmoid, or Cribriform Bone, in the fore part of the Base of the Cranium.

Its *Cuboid Figure*, and division into middle and lateral portions, which are connected together at the upper part.

The *Cribriform Plate*, from which the Bone has its name, placed horizontally at the upper part of the Bone, and perforated, excepting at its posterior portion, with many Holes, disposed irregularly and of different sizes, for the transmission of the Branches of the First, or Olfactory Pair of Nerves.

In the recent Subject, these Holes are so much filled up by the Processes of the Dura Mater which inclose the Nerves, that they are much less evident than in a Bone where the Membranes have been removed.

The *Crista Galli*, or Process compared to the Comb of a Cock, arising perpendicularly from the middle of the Cribriform Plate, and highest at the fore part, becoming gradually lower in its passage backwards.

To the edge of this Process, and to the *unimperforated* part of the Cribriform Plate, the Falx of the Dura Mater is fixed.

A *Notch* at the fore part of the root of the Crista Galli, contributing, in a small degree, to the formation of the Foramen Cæcum of the Frontal Bone.

The *Nasal Plate*, extending downwards and forwards from the base of the Crista Galli, to form the upper and back part of the Septum Narium, or Partition of the Nostrils.

The greater part of this Process is very thin, but towards its anterior and under edge it becomes thicker, for its firmer junction with the Bones and middle Cartilage of the Nose.

It is frequently bent a little to one side; in such cases, the two Nostrils become unequal in size.

The *Ethmoid Cells*, sometimes termed *Labyrinth*, of an indeterminate number, size, and form, placed under the Cribriform Plate, a little to the outside of the Nasal Lamella, separated from each other by thin Partitions, and serving the same purposes as the Frontal Sinuses.

Their *communications* with each other, with the opening of the Frontal Sinuses of the corresponding side, and also with the Cavity of the Nose.

The *Os Spongiosum Superius*, on each side, projecting inwards and downwards into the Cavity of the Nose, from the Ethmoid Cells, at the side of the Nasal Lamella, and serving for enlarging the Organ of Smell.

The *Triangular Form*, and *thick Spongy Texture* of each at its under edge.

Its *convexity* towards the Septum, and *concavity* outwards.

In the Quadruped, this Bone is convoluted like a

Shell or a *Turban;* hence, in the Human Species, as well as in the Quadruped, it is frequently called *Concha*, vel *Os Turbinatum.*

The *Ossa Plana*, or *Orbitar Plates*, for covering a large share of the Ethmoid Cells, and forming the greater part of the inner sides of the Orbits.

On the upper edge of each Os Planum, two small Notches appear, which, with similar Notches in the Frontal Bone, form the Internal Orbitar Holes.

The Substance of the Ethmoid Bone is the thinnest of any of the Bones of the Cranium, the Ossa Plana, and parts which form the Ethmoid Cells, being as thin as writing-paper, and extremely brittle. It differs, besides, from almost every other Bone in the Body, in its Sides or Walls being formed of single Lamellæ, with scarcely any Medullary Cells, the Crista Galli excepted.

The *connection* of the Cribriform Plate to the Orbitar Plates of the Frontal Bone by the Ethmoid Suture; and to the Sphenoid Bone by a Suture common to the two Bones, but generally considered as belonging to the latter.

The *connection* of the Ossa Plana to the Orbitar Plates of the Frontal Bone, by part of the Transverse Suture.

The *posterior edge* of the Nasal Plate, joined to the Processus Azygos of the Sphenoid Bone.

Its *upper edge*, joined to the Nasal Processes of the Frontal and Nasal Bones.

Its *anterior edge*, joined to the middle Cartilage of the Nose.

The Ethmoid Bone assists in sustaining the Anterior

Lobes of the Brain, gives passage to the Olfactory Nerves, attachment to the Falx, forms a large portion of the Organ of Smelling, and of the inner sides of the Orbits, but has no Muscles attached to it.

In the Fœtus, the Ethmoid Bone is divided into two by a Cartilaginous Partition, which afterwards forms the Nasal Plate and Crista Galli. The other parts of the Bone are completely ossified.

Os Sphenoides.

Here attend to,

The *Situation* of the Sphenoid, Cuneiform, or wedge-shaped Bone, in the middle of the Cranium.

Its *irregular Figure*, which has been compared to that of a Bat with extended wings.

The *Temporal Plates*, or *Wings*, placed at the sides of the Bone, and each hollow at the upper and outer part, for lodging a share of the Temporal Muscle; and also at the under and outer part, where the Pterygoideus Externus has some of its origin.

The *Orbitar Plates*, at the fore part of the Temporal Wings, forming a portion of the outside of the Orbits.

The upper and fore part of the Temporal Plates, forming irregular Surfaces, where they are connected to the under and lateral portions of the Frontal Bone.

The *Spinous Process*, at the under and back part of each Temporal Plate.

A *Styloid Process*, frequently observed at the point of the Spinous, from both of which the Circumflexus Palati arises.

Between the Temporal and Spinous Processes, a *ragged Arch* for receiving the fore part of the Squamous Plate of the Temporal Bone.

The two *Pterygoid*, or *Aliform Processes*, placed almost perpendicular to the Body of the Bone. The Pterygoid Processes are compared to the wings, though more properly resembling the feet of the Bat. Each is composed of two Plates.

The *External Plate*, *broad* and *hollow* without, where the External Pterygoid Muscle has its origin. Between the root of this Plate and that of the Temporal one, a large Depression, where the principal part of the External Pterygoid Muscle arises. At the fore part of this is another Depression, forming part of the opening common to the Sphenoid, Malar, and superior Maxillary Bones.

The *Internal Plate*, *narrower* and *longer* than the External, and, with its fellow on the opposite side, forming the back part of the Nose.

A *hook-like Process* upon the Internal Plate, over which the Circumflexus Palati moves as on a Pulley.

The *Fossa Pterygoidea*, facing backwards between the Pterygoid Plates, giving rise to the internal Pterygoid Muscle.

A *small Depression* at the back part of the root of the internal Pterygoid Plate, which gives origin to part of the Circumflex Muscle of the Palate.

A *Groove* on each side, which extends at the inner part of the Bone, between the root of the Styloid Process and that of the internal Pterygoid Plate, assisting in the formation of the Eustachian Tube.

The two *Triangular Processes,* which adhere to the under part of the Sphenoid, and to the Ethmoid Bone, and which are considered as two of the Bones of the Face.

The *Processus Azygos,* standing single, and forming a sharp ridge, which projects from under the middle and fore part of the Bone. This Process is often bent to one side, dividing the two Nostrils unequally.

The *Clinoid Processes,* seen on the inside of the Bone, compared to the supporters of a bed, of which there are,

Two Anterior, projecting from the fore and lateral part of the Body of the Bone, and extending horizontally outwards; each terminating in a point which obtains the name of *Transverse Spinous Process ;*

One Posterior, situated transversely, some way behind the anterior Processes, but projecting obliquely upwards and forwards, and frequently ending in two Knobs, which also incline obliquely forwards, and form two Posterior Clinoid Processes.

Sometimes one or both of the anterior Clinoid Processes are united with the posterior, forming an Arch over the internal Carotid Artery.

The *Processus Olivaris,* a small ridge running transversely between, and a little behind, the roots of the Anterior Clinoid Processes, and considered by some as a fourth Clinoid Process.

Between the anterior Clinoid Processes, a *small pointed Process* frequently juts forwards, to join the Cribriform Plate of the Ethmoid Bone, from which it is sometimes called Ethmoid Process.

The *Temporal Fossæ* of this Bone, which lodge a share of the lateral Lobes of the Brain.

A *Fossa* between the anterior Clinoid Processes, where part of the anterior Lobes of the Brain rests.

A *Depression* before the Processus Olivaris, where the conjoined Optic Nerves lie; and a Fossa on each side of it, where these Nerves are situated, previous to their entering the Orbits.

The *Fossa Pituitaria, Sella Turcica, Ephippium,* or *Turkish Saddle,* situated between the Processus Olivaris and posterior Clinoid Process, but open laterally, for lodging the Glandula Pituitaria.

A *Notch,* running upwards at each side of the Posterior Clinoid Process, and from it a *slight impression,* stretched along the lateral parts of the Sella Turcica, and terminating in a Pit at the root of the anterior Clinoid Process. These Depressions point out the course of the internal Carotid Arteries, when they have entered the Cranium, and previous to their perforating the Dura Mater, to be dispersed upon the Brain.

Besides these Impressions, several others may be observed, made by Nerves and Vessels leading to or from their respective Foramina in the base of the Cranium.

The Foramina observed in this Bone are placed at the roots of the Temporal Processes, or between these and the Body of the Bone, and are as follows, viz.

The *Foramina Optica* between the roots of the anterior Clinoid Processes and body of the Bone, for the transmission of the Optic Nerves and Ocular Arteries.

Sometimes, though rarely, there are Foramina peculiar to these Arteries.

The *Foramina Lacera Superiora*, or *Superior Orbitar Fissures*, under the anterior Clinoid Processes and their transverse Spinous Parts, for the passage of the third, fourth, first part of the fifth, and the sixth pair of Nerves, with the Ocular Veins.

The Foramina Lacera are largest at their inner ends. At their outer extremities they are considerably smaller, and are partly formed there by the Os Frontis; hence they may be ranked among the common Holes of the Cranium.

The *Foramina Rotunda*, a little behind the Foramina Lacera, for the passage of the second part of the fifth pair of Nerves, which are termed also Superior Maxillary.

From the outer end of the Foramen Rotundum, a *small Groove* frequently extends outwards between the Ridge separating the Orbitar from the Temporal Process, and points out the course of a Branch of the Superior Maxillary Nerve to the Temporal Muscle.

The *Foramina Ovalia*, considerably larger than the Foramina Rotunda, and placed farther back, and more externally, for the passage of the third part of the fifth pair of Nerves, and commonly for the passage of the Veins also, which accompany the principal Arteries of the Dura Mater.

The *Foramina Spinalia*, a little to the outer and back part of the Foramina Ovalia, and in the points of the Spinous Processes, for the transmission of the middle or principal Trunks of the Arteries of the Dura Mater, the impressions of which are so conspicuous on the inner side of the Temporal Bones.

The *Foramina Pterygoidea*, vel *Foramina Pterygo-palatina*, termed also, after the discoverer, *Foramina* VIDIANA, at the roots of the inner Plates of the Pterygoid Processes, for the passage of two recurrent or reflected Branches of the second part of the fifth Pair of Nerves.

The *Foramina Pterygoidea* are the smallest of the Sphenoid Holes, and cannot be distinctly seen in the entire Skull, being partly concealed by the Palate-Bones.

Sometimes one or more small passages are observed in or near the Sella Turcica, for the transmission of Blood-vessels into the Sphenoid Sinuses, or to the substance of the Bone. These passages were, in former times, considered by some Authors as conducting Pituita by the Sphenoidal Sinuses into the Nose.

The *Foramina Lacera Anteriora*, common to the points of the Partes Petrosæ and the Sphenoid Bone.

In a recent Skull, each of these Holes is filled behind by a thin Plate of Bone, which covers the internal Carotid Artery, and farther forwards, by a Cartilaginous Ligament, which lies over the EUSTACHIAN Tube, both of which drop out by maceration. Through this opening, also, Mucus was formerly supposed to be conveyed from the Glandula Pituitaria to the Nose.

The *Sphenoid Sinuses*, occupying the whole of the Body, or middle part of the Bone, at the under and fore part of the Sella Turcica, answering the same purposes with the Ethmoid and Frontal Cells.

A *complete Partition* running perpendicularly between the right and left Sphenoid Sinuses.

A *Paſsage* from the upper and fore part of each of the Sphenoid Sinuses, descending in a slanting direction into the Meatus Superior, or superior-posterior part of the Nose.

The two Sinuses are frequently of unequal size, and sometimes there is but one large Cavity, with an opening into one of the Nostrils; sometimes one of these passages is shut. In some Subjects, instead of Sinuses, the Body of the Bone is composed of large Cells.

The *substance* of this Bone is the most unequal of any in the Body, some parts being extremely thin, while others are thicker than most parts of the Cranium.

The *connection* of the Bone to all the other Bones of the Cranium, by the Sphenoid Suture, though others, as the Transverse, Ethmoid, &c. are confounded with it.

The Sphenoid Bone forms the middle of the Base of the Cranium, a share of the Temples, Orbits, and Nose, and assists in supporting the anterior and middle Lobes of the Brain. It gives passage to the Blood-vessels of the Dura Mater and Eye, and to the greater part of the Cerebral Nerves.

It affords origin to the Levator Palpebræ, Laxator Tympani, and all the Muscles of the Eye-ball, excepting the Obliquus Inferior; to part of the Buccinator, Pterygoideus Externus et Internus, Temporalis, Circumflexus Palati, and Constrictor Pharyngis Superior.

In the Fœtus, the Temporal Wings are separated from the Body of the Bone by maceration, and there are no Sphenoid Sinuses.

In the early period of life, the Sphenoid Bone is joined to the Cuneiform Process of the Occipital Bone by a thin Cartilage, which, by the age of fifteen or sixteen years, is in general completely absorbed, and the two Bones so firmly united by an accretion of substance, or in the manner that Processes are united to the bodies of long Bones, that DR SOEMMERRING has described them as one Bone, under the name of *Spheno-occipitale.*

OF THE BONES OF THE FACE.

THE Bones of the Face, and the relative proportions between the Face and Cranium, vary considerably among people of different nations, but they likewise vary among the individuals of the same country. It is difficult, therefore, to ascertain the proportions with accuracy. An Angle termed *Facial*, however, is considered by some late Authors as being the simplest method of determining this circumstance.

The Facial Angle is formed by drawing a line through the external Auditory Passage and bottom of the Nostril, and another, termed *Facial*, from the convexity of the Forehead to the under and fore part of the Upper Jaw, so as to intersect the former.

In the Grecian, as measured from the Antique Statue, the Facial Angle is found to be about 90°, or between 90° and 100°; in the European, about 80°, or between

80° and 90°; and in the African, on account of the greater prominence of the Jaws, about 70° only.

According to Dr Camper, the boundaries of the Facial Angle, in the Human Subject, are 70° and 80°.

By a vertical longitudinal section of the Head, the area of the Face in the European is observed to be only half of that of the Cranium, but is somewhat more in the Negro; or, the Face is larger in the one, while the Cranium is bigger in the other.

In the Bones of the Face we observe,

Their *Division* into *Upper* and *Under Jaws.*

The Upper Jaw, or Maxilla Superior, besides the Teeth, *composed of seven Pair of Bones, and one without a fellow; viz.*

Two Ossa Nasi; Two Ossa Unguis; Two Ossa Malarum; Two Ossa Maxillaria Superiora; Two Ossa Palati; Two Ossa Spongiosa Inferiora; Two Ossa Triangularia; and the *Vomer.*

The Lower Jaw, or Maxilla Inferior, consists of a *single Bone*, with the Teeth.

The Bones of the Upper Jaw are joined together by Sutures which have no distinct Indentations, like those of the Cranium; but, like them, they are frequently found obliterated in the Skulls of old people. The Bones here, in consequence of the nature of the Sutures, have no motion but what they possess in common with the Cranium. The Sutures shall be taken notice of in the description of the Bones between which they are placed.

OSSA NASI.

Their *Situation* in the upper and fore part of the Nose.

The *oblong Form* of each, though irregularly so.

The *thick*, *ragged*, upper end, where it forms a strong connection with the Frontal Bone.

Each narrowest a little below the upper end, and bent backwards.

The Inferior Extremity, thinner and broader than the rest of the Bone, and unequal where it gives attachment to the Cartilaginous part of the Nose.

The under half convex externally, by which, when the Bone is joined to its fellow, a strong Arch is formed, that is fitted for resisting injury.

The inner margin thick and broad above, but thin below, where it joins its fellow on the opposite side.

Its internal *Concavity*, where it forms part of the Cavity of the Nose.

The *Spinous Process*, which joins the Nasal Lamella of the Ethmoid Bone, and thereby forms part of the partition of the Nose.

One or more *Holes* externally, for transmitting Vessels into the Substance of the Bone, or to the Membrane of the Nose.

The Substance of the Bone remarkably firm and strong, with very few Cancelli.

Its *Connection* to the Frontal Bone by the Transverse Suture:

To its fellow by the anterior Nasal Suture.

The Ossa Nasi form the upper and fore part of the Nose, and give attachment to the Compressor Naris, and to part of the Occipito-Frontalis.

In the Fœtus, the Ossa Nasi are proportionally short, but are otherwise complete.

OSSA UNGUIS, vel LACRYMALIA.

Their *Situation* at the inner and fore part of the Orbit.

Their *Size*, the least of the Bones of the Face.

The *Division* of each externally, into *two depressed Surfaces*, with a *Ridge* between them which forms the boundary of the Orbit at the inner Angle.

The Ridge between these surfaces frequently forms a little Process below, where it assists in covering part of the Lacrymal Sac.

The *posterior Surface*, the larger of the two, forming part of the Orbit; and having the appearance of being a continuation of the Pars Plana of the Ethmoid Bone.

The *anterior Surface*, for lodging part of the Lacrymal Sac and Duct, and perforated by small Holes, through which Fibres pass, to make a firm connection between the Bone and its investing Membrane.

In the Anterior Depression, the perforation is made in performing the operation for Fistula Lacrymalis.

The *inner*, or *Nasal Surface*, composed of a *Furrow* and *two irregular convex Surfaces*, corresponding with the anterior Ethmoid Cells.

The *Substance* of the Bone is the *thinnest* and *most* *brittle* of any in the Body, in consequence of which it is frequently met with in an imperfect state.

Its *Connection* to the Frontal Bone by the Transverse Suture, and to the Os Planum by the Ethmoid Suture.

Internally, it is connected with the Ethmoid Cells.

The Os Unguis forms the inner and fore part of the Orbit, covers part of the Ethmoid Cells, and receives a share of the Lacrymal Sac.

In the Fœtus, it is fully formed.

OSSA MALARUM, vel OSSA JUGALIA.

The *Situation* of each in the outer part of the Cheek.

The *external convex Surface*, smooth and of a somewhat rhomboid form.

The *posterior hollow Surface*, for lodging part of the Temporal Muscle.

The *superior Orbitar Process*, forming part of the outside of the Orbit.

The *inferior Orbitar Process*, forming part of the lower Edge of the Orbit.

The *Maxillary Process*, forming the under part of the Prominence of the Cheek.

The *Arch* between the Orbitar Processes, which forms near a third part of the anterior Circumference of the Orbit.

The *Zygomatic Process*, the most conspicuous, extending backwards, and becoming oblique, to join the Zygomatic part of the Temporal Bone, and with it to form an Arch over the Temporal Muscle.

The *Internal Orbitar Plate*, hollow and extending

back

back between the Orbitar Processes, to form a share of the outer, under, and fore part of the Orbit.

A *Passage* through the Bone, for the transmission of small Vessels or Nerves from the Orbit to the Face, and sometimes from the Face to the Orbit.

A *Notch* in the outer part of the internal Orbitar Process, assisting in the formation of the large slit at the bottom of the Orbit.

The *Substance* of the Bone is thick and hard, with some Cancelli.

The *Connection* of the superior Orbitar Process and internal Orbitar Plate to the Frontal and Sphenoid Bones, by the Transverse Suture.

The *Connection* of the Zygomatic Process to the Temporal Bone, by the Zygomatic Suture.

The Os Malæ closes the outer part of the Orbit, and gives form to the Cheek. It affords Origin to the Zygomatici Major et Minor, to part of the Masseter and Temporalis, and insertion to part of the Aponuerosis Temporalis.

In the Fœtus, the Bone is fully ossified.

OSSA MAXILLARIA SUPERIORA.

Their *Situation* in the fore part of the Upper Jaw, and sides of the Nose.

Their *Size*, the largest of the Bones of the Upper Jaw, on which account the Bones have got their name.

The *Nasal*, or *Angular Process* of each, forming a portion of the side of the Nose, and of the inner part of the Orbit, and overlapping the outer Edge of the Os Nasi above, while that Bone covers the Edge of the Nasal Process below.

A *Ridge* at the under and inner side of the Nasal Process, for supporting part of the Os Spongiosum Inferius.

The *Orbitar Plate*, facing obliquely outwards, and forming a large share of the under side of the Orbit.

The *Malar Process*, at the outside of the Orbitar Plate, *unequal*, *ragged*, and of a triangular form, where it contributes, with the Os Malæ, to form the Prominence of the Cheek.

The *Tuberosity*, or *Bulge* at the back part of the Bone, which forms the posterior boundary of the Cavity called *Antrum Maxillare*, and gives origin to a portion of the External Pterygoid Muscle.

A *Depression* behind the Malar Process, where the under end of the Temporal Muscle plays.

A *Depression* at the under and fore part of the Malar Process, where the Muscles which raise the Upper Lip and corner of the Mouth originate, and where a Branch of the Fifth Pair of Nerves is lodged, and commonly a large portion of Fat.

The *Alveolar Arch*, at the under part of the Bone, of a Spongy nature, where the Alveoli or Sockets of the Teeth are placed.

The *Alveoli*, or *Sockets* for the Teeth, *porous*, for the firmer adhesion of the reflected Membrane of the Gums, and for the transmission of Blood-vessels into the Substance of the Bone; the Sockets corresponding in number with those of the Teeth, and varying in depth, size, and form, according to the nature of the Teeth fixed in them.

The *Palate Plate* or *Process*, placed horizontally, forming part of the Roof of the Mouth, and of the Bottom of the Nose.

The *Palate Plate*, *thin* in its middle, and *thick* at its edges; *smooth* towards the Nose, but *rough*, *unequal*, and *porous* below, for the firm connection of the Membrane of the Palate, and for the passage of Blood-vessels and Nerves to the Substance of the Bone.

The *Nasal Spine*, contributing, in a small degree, to the formation of the Septum of the Nose.

An *Arch* formed by the Palate Plate, both above and below, for enlarging the Cavities of the Nose and Mouth.

In advanced life, where the Teeth have fallen out, the Roof of the Mouth, which was formerly arched, becomes flat, in consequence of an absorption of the Alveoli, and the Cavity of the Mouth is now diminished in size.

A *Notch* forming the under and fore part of the Nostril, to the edge of which, and to the corresponding one of the Nasal Process, the Cartilages of the side of the Nose are connected.

The *Lacrymal Fossa*, at the outer and back part of the Nasal Process, which, with that of the Os Unguis, forms a passage for the Lacrymal Duct into the Nose.

A *Canal*, termed *Infra-orbitar*, in the Orbitar Plate, terminated anteriorly by the *Foramen Infra-orbitarium*, through which the Infra-orbitar Branch of the second part of the Fifth Pair of Nerves, with a Branch of the internal Maxillary Artery, pass to the Face.

From this Canal, minute Passages lead downwards, for receiving the Blood-vessels and Nerves that supply the fore part of the Jaw and corresponding Teeth.

The *Foramen Incisivum*, vel *Palatinum Anterius*, behind the Fore-Teeth, common to both Bones below, but proper to each above, and filled with a Process of the Soft Palate, and with small Vessels and Nerves, which run between the Membranes of the Mouth and Nose, the Nerves chiefly belonging to the Naso-palatine Branch of the Second Branch of the Fifth Pair.

In some Subjects, there is a distinct *Ductus Incisivus*, leading from one or from both Nostrils into the Cavity of the Mouth, similar to that which is always found in the large Quadrupeds.

A small *Hole* commonly found in the Nasal Process, and some *minute Passages* at the back part of the Tuberosity, for the transmission of Blood-Vessels and Nerves into the Substance of the Bone and Large Dentes Molares, and into the Antrum Maxillare.

The *Sinus Maxillaris*, *Antrum Maxillare*, or, from its describer, HIGHMORIANUM, of great size, being the largest of all the Sinuses of the Head, occupying the whole inner part of the Body of the Bone. It is situated under the Orbitar Plate, and above the large Dentes Molares, and destined for the same purposes as the other Sinuses of the Bones of the Head.

The Partition between the Sinus and Sockets of the Teeth is commonly of considerable thickness; but not unfrequently there is only a thin Plate interposed, and small Prominences, containing the points of the roots of the Teeth, may often be observed in the middle of this Cavity.

The *Opening* of the Sinus, large in the separated Maxillary Bone, but, in the connected state, so covered by the inferior Spongy Bone, and by the Palate-Bone and Membranes, as to leave only one, and sometimes two Apertures, little larger than to admit the point of a Surgeon's Probe. The Aperture is situated at the upper part of the Sinus, and descends obliquely backwards to terminate in the Cavity of the Nose, between the Ossa Spongiosa Superius et Inferius.

The *Substance* of this Bone is hard and dense, except at the Alveoli, where it is remarkably spongy.

The *Connection* of the Bone to the Os Frontis, by the Transverse Suture,—to the Os Unguis, by the Lacrymal Suture,—to the Os Nasi, by the Lateral Nasal Suture,—to the Os Malæ, by the internal and external Orbitar Sutures,—to the Os Planum, by the Ethmoid Suture,—to its fellow, by the longitudinal Palate Suture,—to its fellow also, between the fore part of the Nose and Mouth, by the Mystachial Suture.

The Ossa Maxillaria form the greater part of the Nose and Roof of the Mouth, a considerable part of the Orbits and Cheeks, and contain all the Teeth which belong to the Upper Jaw.

The Superior Maxillary Bone gives origin to the Obliquus Inferior Oculi, Levator et Depressor Labii Superioris Alæque Nasi, Levator Anguli Oris,—to part of the Orbicularis Palpebrarum, Pterygoideus Externus, Buccinator, Masseter, and Constrictor Pharyngis Superior.

In the Fœtus, there are six Sockets for the Teeth,—no Tuberosity, and the Maxillary Sinus is only beginning to form.

OSSA PALATI.

Their *Situation* in the back part of the Palate.

The *Oblong Shape* of the Palate Plate of each, which forms the back part of the Osseous Palate.

Its *posterior Curved Edge*, where it is connected with the Velum Palati; also the point at the inner extremity of the Curve, for the origin of the Muscle of the Uvula.

Its *thick, strong Substance*, where it joins its fellow.

Its *Spinous Process* or *Crest*, at the inner edge of the Palate-Plate, joining the under part of the Vomer, and contributing to the formation of the Septum Narium.

The *Pterygoid Process*, of a *Triangular or Pyramidal form*, with *Fossæ* corresponding to the Pterygoid Plates of the Sphenoid Bone.

The *Nasal Plate*, forming a portion of the side of the Nose and Antrum Maxillare.

A *Ridge* on the inside of this Plate, upon which the back part of the inferior Spongy Bone rests.

The *Two Orbitar Processes*, at the upper and back part of the Nasal Plate, contributing a little in the formation of the Orbit, and of the Ethmoid and Sphenoid Sinuses, being hollow within.

The *Anterior* Orbitar Process, the larger of the two, with its upper Surface appearing in the bottom of the

Orbit, behind the back part of the Os Planum and Os Maxillare.

A *Notch* between the Orbitar Processes, forming part of the *Foramen Spheno-Palatinum;* and sometimes this a complete Foramen, for the passage of the Nasal Vessels and Nerves, the former belonging to the Internal Maxillary, and the latter to the Second of the Fifth Pair.

The *Foramen Palatinum Posterius*, vel *Palato-Maxillare*, at the outer end of the Palate-Plate of this Bone, but common to it and the Maxillary Bone, for the transmission of Nerves of the Second Branch of the Fifth Pair, with associate Blood-Vessels, which are the principal Nerves and Vessels of the Palate.

A *small Hole* frequently observed behind the former, and communicating with it, for the passage of a Branch of the Palatine Nerve.

The *Foramen Spheno-Maxillare*, *Lacerum Inferius*, or *Inferior Orbitar Fissure*, at the under and outer part of the Orbit, and common to the Cuneiform, Maxillary, Malar, and Palate Bones, for lodging Fat belonging to the Eye, and transmitting small Twigs of Vessels and Nerves into the Orbit.

The Palate-Plate of this Bone and its Pterygoid Process are firm and strong; but the Nasal Plate and Orbitar Processes are thin and brittle.

The *Connection* of the Os Palati to the Palate-Plate of the Maxillary Bone, by the Transverse Palate Suture; —to the Maxillary Bone, at the side of the Nose and bottom of the Orbit, by the Palato-Maxillary Suture; —to the Pterygoid Process of the Sphenoid Bone, by the Sphenoid Suture;—to the Os Planum and Ethmoid Cells, by the Ethmoid Suture;—and to its fellow, by the Longitudinal Palate Suture.

The Palate Bone forms part of the Palate, Nose, and Orbit, covers a share of the Ethmoid, Sphenoid, and Maxillary Sinuses, gives origin to the Azygos Uvulæ, to a portion of the Pterygoideus Externus, and Insertion to part of the Circumflexus Palati.

In the Fœtus, the Palate Bone is complete, but there are no Cells in the Orbitar Processes.

OSSA SPONGIOSA, vel TURBINATA INFERIORA, vel CONCHÆ INFERIORES.

The *Situation* of each, projecting in the under part of the side of the Nose.

Its *triangular form* and spongy appearance resembling the Os Spongiosum Superius.

Its *Convexity* towards the Septum Nasi, and *Concavity* outwards.

The *under edge* placed horizontally near the under part of the Nose, more or less convoluted, of considerable thickness and strength, and ending in a thin sharp point behind.

The *two Processes* at the upper part of the Bone, the anterior ascending and forming part of the Lacrymal Groove, and the posterior descending in form of a Hook, to make part of the side of the Maxillary Sinus, and to contract the opening of that Cavity.

The *Connection* of this Bone to the Os Maxillare, Os Palati, and Os Unguis, by a distinct Suture in the young Subject; but in the Adult, by a concretion of substance.

The Ossa Spongiosa Inferiora afford a large surface for extending the Organ of Smell, by allowing the Membrane of the Nose to be expanded, upon which the Olfactory Nerves are dispersed. They form a boundary between the Middle and Inferior Meatus of the Nose; cover the under Orifice of the Lacrymal Canals; assist also in the formation of these Canals, and of the Orifices of the Maxillary Sinuses.

In the Fœtus, these Bones are almost complete.

OSSA TRIANGULARIA, vel CORNUA SPHENOIDALIA.

The *Situation* of each triangular Bone between the Body of the Sphenoid Bone and root of its internal Pterygoid Process, where it covers the under part of the Sphenoid Sinus.

Its *Connection* to the back part of the Ethmoid Bone. In an old person, it grows so firmly to the Sphenoid Bone, as to be considered by some Authors as one of its Processes.

VOMER.

Its *Situation* in the under part of the Septum Nasi, where it separates the Nostrils from each other.

It commonly descends perpendicularly, but it is frequently bent to one side, in which case the one Nostril is rendered larger than the other.

Its *Form* approaching that of a Rhomboid, or it is compared to that of the Ploughshare, from which it has its name.

The *superior* and *posterior* part, *thick* and *strong*, with a *Furrow* above to receive the Processus Azygos of the Sphenoid Bone.

The *superior part*, with a *Groove* to receive the Nasal Plate of the Ethmoid Bone, and the Cartilage of the Nose.

The *inferior Edge* connected with the Spinous Processes of the Palate and Maxillary Bones, by a small Ridge corresponding with a Groove of these Bones.

The *posterior-inferior edge*, thick above, but thin and sharp below, unconnected with any other Bone, and turned to the Cavity of the Throat.

The Vomer has a smooth Surface, and a dense Substance, and consists of two Plates in a young person; but in an old Subject, the Plates are compressed together, so as to render the Bone transparent.

It divides the Cavity of the Nose into right and left Nostrils, receives the middle Cartilage of the Nose, and serves to extend the Olfactory Membranes.

Maxilla Inferior.

The *Figure* of the Maxilla Inferior, or Lower Jaw, compared to that of the letter U; or it forms half of a long oval, with the convex middle part forwards.

The *Division* into *Chin*, *Sides*, and *Processes*.

The *Chin*, extending between the Holes termed *Mental Foramina* at the fore part of the Jaw.

The under part of the Chin more prominent than the upper edge of the Jaw, with a triangular eminence in the middle of its outer Surface, which, with the projecting under edge, renders this part peculiar to Man. This projection of the Chin is less apparent in the Negro, where the Alveolar Border is so expanded as to increase the prominence of the Mouth.

The *Sides*, reaching from the Mental Foramina to the back part of the Bone.

A *Transverse Ridge* on the fore part of the Chin, with depressions on each side, for the Origin of Muscles of the Under Lip.

Small Prominences and *Depressions* on the under, inner, or back part of the Chin, for the attachment of the Frænum Linguæ, and of several Muscles which belong to the Throat.

The *Base*, or *lowest part*, forming the under boundary of the Face.

The *Angle* of the Jaw at the back part of the Base.

Impressions made by the Masseter Muscle upon the outside of the Angle, and also on the Plate which arises from it.

The *Plate*, which rises from the Angle of the Jaw, on each side, running upwards and a little backwards, and terminating in two Processes, termed *Condyloid* and *Coronoid*.

The *Condyloid*, or *Articular Process*, with an oblong rounded head, covered with Cartilage, and placed almost transversely upon a Cervix at the upper and back part of the Bone; though, with respect to each other, the Condyles are somewhat oblique, the external extremity being directed a little forward.

At the under and fore part of the Condyle, a Cavity for the insertion of the Pterygoideus Externus.

The *Coronoid Process*, into which the Temporal Muscle is inserted, *situated* a little below the Condyloid Process, and, in the natural situation of the Jaw, placed on the inner side of the Zygoma.

The Anterior Edge of this Process, forming a Ridge which goes downwards and forwards, terminating at the outside of the Posterior Alveoli. From this the under edge of the Buccinator takes its Origin.

From the inner side of the Coronoid Process, another Ridge seen terminating nearly opposite to the former. To this the Internal Membrane of the Gums, and Mylohyoideus, are attached.

The *Alveolar Process*, and *Alveoli*, nearly similar to those of the Upper Jaw.

The *Alveolar Process*, extending along the Upper Edge of the Bone, from the Coronoid Process of one side to that of the other; and thickest behind, corresponding there with the increased thickness of the Teeth.

The Alveolar Process, composed of two Plates, and divided by cross Partitions, which, as in the Upper Jaw, mark the different Alveoli for the Fangs of the Teeth.

The Posterior Part of the Internal Plate, slanting inwards, and thinner than the external, giving the Jaw a twisted appearance.

Opposite the Alveoli, the External Plate swelling, and giving a fluted form, which is observed in the whole extent of the Alveolar Process of the Upper Jaw, and in the fore part of the Lower Jaw.

At the fore part of the Jaw, the Alveoli are perpendicular, but turn inwards behind, where they are placed nearer the inner than the outer part of the Jaw.

The *Sockets* are worn down by absorption in old age, in consequence of which the Teeth drop out, the Jaw becomes narrower, the face shorter, and, when the Mouth is shut, the Jaw appears more prominent.

The *posterior Maxillary Foramen*, at the roots of the Condyloid and Coronoid Processes, upon the inner side of the Jaw, for the passage of the Third, or inferior Maxillary Branch of the Fifth Pair of Nerves, with the corresponding Blood-vessels, into the Bone.

A *small-pointed Process* at the inner edge of this Hole, where a Ligament goes off to be fixed to the Temporal Bone.

Above the Hole, the Bone *marked* by the passage of the Nerve and Vessels; and below it, commonly a *small Furrow*, pointing out the course of a Branch of this Nerve which goes to the Mylo-hyoideus and the Sublingual Gland.

Between the Posterior Maxillary Foramen and the Angle, the Bone *marked* by the insertion of the Internal Pterygoid Muscle.

The *Anterior Maxillary Foramen*, or *Mental Hole*, at the side of the Chin, where the remains of the Inferior Maxillary Nerve and Vessels come out.

The *Inferior Maxillary Canal*, running in the substance of the Bone, between the Posterior and Anterior Foramina, a little below the roots of the Teeth, and having many Perforations, for the passage of small Branches of Vessels and Nerves which supply the Jaw and Teeth.

The *Tables* of the Jaw, remarkably *thick*, *compact*, and *hard*, and within, furnished with *numerous Medullary Cells*, which surround the Maxillary Canals.

The *Articulation* of the Jaw by its Condyloid Process with the Glenoid Cavity of the Temporal Bone, and also with the Tubercle at the root of its Zygomatic Process.

An *intermediate moveable Cartilage*, thin in the centre and thicker at the edges, is placed in the Articulation of the Lower Jaw, allowing the Condyle to remain in the Glenoid Cavity, in the gentler motion of the Jaw, but admitting it to advance upon the Tubercle or Root of the Zygoma, when the Mouth is widely opened.

The Lower Jaw is a principal agent in Manducation, Deglutition, and Speech; and gives origin to the Depressor Labii Inferioris, Depressor Anguli Oris, Levator Labii Inferioris, Mylo-hyoideus, Genio-hyoideus, and to part of the Buccinator, Genio-hyo-glossus, and Constrictor Pharyngis Superior; insertion to the Temporalis, Masseter, Pterygoidei Externus et Internus, Digastricus, and to part of the Platysma Myoides.

In the Fœtus, the Lower Jaw is somewhat of a semicircular figure, and is composed of two Pieces joined together in the middle of the Chin, by the intervention of a Cartilage. This Union, termed *Symphysis*, gradually ossifies, and leaves no mark of any former division.

TEETH.

The *Situation* of the Teeth, in the Alveoli of the Jaws.

Their *Number*, *sixteen* in each Jaw.

The *Base*, or *Body* of each Tooth, appearing without the Sockets.

The *Roots*, or *Fangs*, placed in the Sockets, and of a *conical* form.

The *Cervix*, or *Collar*, between the Base and Roots of the Teeth.

The *Roots* of the Teeth covered by a *Vascular Membrane*, reflected from the Gums, and serving as a *Periosteum* to the Teeth, and a lining to the Alveoli.

The *Cortex*, or *Enamel*, covering the Base of each Tooth, and becoming gradually thinner towards the Cervix.

The *Fibres* of the Osseous part forming Lamellæ, which run according to the length of the Teeth.

A *Foramen* at the point of the Root of each Tooth, and a Passage leading from it into a common Cavity in the Base of the Tooth, for lodging the Vascular and Nervous Substance called *Pulp* of the Teeth.

Division of the Teeth into *four Classes*, viz.

—On each side of each Jaw,—

Two Incisores;—One Cuspidatus, or *Caninus;—Two Bicuspidati*,

Bicuspidati, or *Small Molares;*—and *Three Large Molares.*

The Incisores, having their *Bases* formed into *Wedges sloped out behind.*

The Cuspidatus, having its *Base* in form of a *Wedge*, like the Incisores, but pointed in the middle.

The Bicuspidati, each with *double points*, one external, the other internal, which, in the Upper Jaw, are nearly upon a level, but, in the Under Jaw, highest on the outside of the Teeth.

The Incisores, Cuspidatus, and Bicuspidati, with *single Roots*, excepting the small Molares of the *Upper Jaw*, which have frequently *two Roots.*

The first of the three posterior, or large Molares of the *Under Jaw*, with *five*, and each of the other two with *four points.*

Each of these three Teeth having *two*, *three*, or sometimes *four roots.*

In the *Upper Jaw*, the first large Molaris having *four*, and each of the other two only *three points.*

In each of these three Teeth, generally *one root more* in those of the *Upper*, than in the corresponding Teeth of the *Under Jaw.*

The last, or backmost Molaris, called *Sapiens*, *smaller*, and having generally *fewer roots.*

The Teeth *connected* to the Sockets by *Gomphosis*, and by a firm adhesion to the Gums.

At Birth, the outer Shell only of the five Temporary Teeth, and of the anterior Permanent Molaris, in each side of each Jaw, is found.

These Teeth are situated in Capsules, within the Jaw,

Jaw. At this period there are no roots formed.

For a fuller description of the Teeth, see VOL. II.

OS HYOIDES, vel OS LINGUALE.

The circumstances to be attended to here are,

The *Situation* of that Bone, at the root of the Tongue and top of the Larynx.

The *Shape*, compared to that of the Greek letter υ, from which the Bone has derived its name.

The *division* of the Bone into Body, two Cornua, and two Appendices.

The *Body* of the Bone, the middle broad part, *convex* before, and *concave* behind, and by much the largest of the five pieces.

The Body of the Bone of an oblong form, placed transversely, and divided anteriorly into an upper and under Surface by a Transverse Ridge.

Several *Impressions* seen on the fore part of its Body, occasioned by the numerous Muscles fixed to it.

The concavity behind oblique, to receive the Thyroid Cartilage, when the Os Hyoides and Larynx are pulled towards each other.

The *Cornua*, extending backwards and upwards from each end of the Body, with their two plain Surfaces slanting from above downwards and outwards, and giving attachment to Muscles and Ligaments of the Tongue and Larynx.

Each of the Cornua becoming gradually smaller in its course backwards, and ending in a round Tubercle, which is connected to the upper Cornu of the Thyroid Cartilage.

Between the Body and Cornua, frequently a Furrow, pointing out the former separation in young Subjects.

The *Appendices*, having the size and form of a grain of decorticated Barley, placed at the upper part of the Articulation between the Body and Cornua, for the attachment of Muscles.

From each Appendix, a *Ligament* is sent up to the Styloid Process of the Temporal Bone, to assist in connecting the Os Hyoides to the Cranium.

The Substance of this Bone is Cellular, but covered with a firm external Plate, which adds considerably to its strength.

The Os Hyoides is not immediately connected to any other Bone, but is kept in its place by numerous Muscles and Ligaments, to be afterwards mentioned.

The Os Hyoides serves as a Lever for numerous Muscles acting upon the Tongue, Larynx, and Fauces.

It gives origin to the Hyo-glossus, and to part of the Constrictor Pharyngis Medius; insertion to the Sterno-hyoideus, Omo-hyoideus, Stylo-hyoideus, Genio-hyoideus, Thyro-hyoideus, to part of the Genio-hyo-glossus, Digastricus, and the Mylo-hyoideus.

At Birth, the greater part of the Bone is in a Cartilaginous state, and the Appendices continue so for many years after the other parts are completely ossified.

In a young Adult, the five pieces of which this Bone is composed may be separated by putrefaction, in consequence of which SOEMMERRING describes them as so many distinct Bones.

TRUNK.

We observe here,

The Trunk, *composed* of the *Spine*, *Pelvis*, and *Thorax.*

Spine.

The *Spine*, reaching from the Condyles of the Occipital Bone, to the lower end of the Os Coccygis.

The Spine appearing *straight*, when viewed anteriorly or posteriorly.

The several *Curves* of the Spine, when viewed in a lateral direction; the Curvatures accommodating themselves to the soft parts of the Neck, Thorax, Abdomen, and Pelvis.

The Spine, *composed* of a long upper, and short under Pyramid, joined together by their Bases.

The Upper Pyramid, composed of *true Vertebræ*, or Bones which turn upon each other.

The Under Pyramid, formed of *false Vertebræ*, or Bones which, at an early period of life, resemble the true Vertebræ, but which afterwards grow together, so as not to contribute to the motions of the Trunk of the Body.

TRUE VERTEBRÆ.

TRUE VERTEBRÆ IN GENERAL.

The *true Vertebræ,* commonly twenty-four in number, though sometimes only twenty-three; or, on the contrary, twenty-five.

Each of the true Vertebræ composed of a *Body* and *Processes.*

The *Body* of a *spongy* nature, with *upper* and *under Surfaces* placed horizontally.

The anterior *convexity* of the Body, and posterior *concavity.*

Numerous *small Holes* on the anterior and lateral parts of the Body, for the passage of Blood-vessels into the Substance of the Bone, or for the attachment of Ligamentous Fibres.

A *Ring of Bone,* at the upper and under edges of the Body, of a firmer texture than the rest of its Substance, and thereby adding to the general strength of the Bone.

The Ring of Bone forming a *superficial Cavity,* which receives the Intervertebral Substance.

The Bodies of the Vertebræ in general smaller and more solid above; as they descend, they become larger and more spongy.

The *Intervertebral Substances,* of a *Cartilago-ligamentous nature,* placed between the Bodies of the Vertebræ,

tebræ, for fixing them together, and allowing the Spine to be moved in all directions.

The Intervertebral Substances, *composed* of *Concentric Lamellæ*, with their edges firmly fixed to the Bodies of the Vertebræ.

The Lamellæ of these Substances, formed of *Oblique Fibres*, which decussate each other, and are very compressible.

The *Centre* of these Substances changes from *Lamellæ*, and puts on the appearance of a *Mucus* or *Pulp*, which has little compressibility, and serves as a *pivot* upon which the other parts of the Substance can move, with such gradual yielding as to lessen shocks in the Spine in violent motions of the Body.

The *Intervertebral Substances*, like the Vertebræ themselves, *larger* and *thicker* as they descend, to give more security to the parts they support.

An *Arch* sent out from the back part of the Body of each Vertebra, which, together with the Body, forms a *large Hole;* and the different Holes being placed over each other, a Canal is formed for lodging the Spinal Marrow.

A *Notch* at the upper and under edges of each side of the Arch, forming, in the contiguous Vertebræ, the passages of the Spinal Nerves.

The Processes of each Vertebra, seven in number, viz. two Superior Oblique, two Inferior Oblique, two Transverse, and one Spinous.

The *two Superior Oblique*, or *Articulating Processes*, covered with Cartilage, placed upon the upper part of the sides of the Arch.

The *two Inferior Oblique*, or *Articulating Processes*, also covered with Cartilage, and placed upon the under part of the sides of the Arch.

The *two Superior Oblique Processes* of one Vertebra, articulated with the *two Inferior Oblique* of the Vertebra immediately above it.

Round the edges of the Oblique Processes, *rough Lines* for the attachment of their articulating Ligaments.

The *two Transverse Processes* projecting from the sides of the Arch, and between the Oblique Processes.

The *Spinous Process*, sent out from the back part of the Arch, which, being sharp and pointed, gives name to the whole chain of Bones.

The *Edges* of this Process, as well as of the Arch, *rough*, where Ligaments come off which fix the corresponding parts of the contiguous Vertebræ together.

The *Substance* of the Processes stronger, with a thicker external Plate than the Bodies of the Vertebræ.

The Vertebræ are joined to each other by a double Articulation, their Bodies being connected by the Intervertebral Substances already described; and their Oblique Processes so joined by their Ligaments, as to allow a small degree of motion to all sides.

In the Fœtus, each Vertebra consists of three pieces connected by Cartilages; viz. the Body not fully ossified, and a curved Bone on each side; forming a small share of the Bony Arch, on which are observed, the Oblique Processes complete, the beginning Transverse Processes, but no Spinal Process.

Peculiarities of the Vertebræ.

The Vertebræ, on account of certain peculiarities, *divided* into *Cervical*, *Dorsal*, and *Lumbar*.

The *Cervical Vertebræ*, or *Vertebræ of the Neck*, commonly seven, in some very rare cases only six; or, on the contrary, eight in number; having their Bodies *smaller* than those of the other Vertebræ.

The Bodies of the Cervical Vertebræ *flattened* anteriorly, for the passage of the Esophagus, and for the attachment of the Longi Colli and Recti Majores; and *flattened* also posteriorly, corresponding with the breadth of the Spinal Marrow. The Bodies of these Vertebræ mutually embracing each other, the under and fore part of each overlapping, in a small degree, the upper and fore part of the Vertebra immediately below, while the lateral parts of the inferior Vertebra overlap the sides of that directly above it.

The *Articulating Processes*, *more oblique* than the rest.

The *Transverse Processes*, *perforated* for the passage of the Vertebral Blood-vessels, and *hollowed* above for the transmission of the Spinal Nerves.

The *Spinal Processes*, placed horizontally, *shorter* than the rest, and *forked* for the attachment of the Musculi Inter-spinales.

The Cervical Vertebræ admit of *free motion*, in consequence of the thickness of their Cartilages, and the nature of their Processes, but give *less protection* behind to the Spinal Marrow than is given in other parts of the Spine, in consequence of which, punctures in the back part of the Neck are more apt to become fatal.

The first Vertebra, called *Atlas*, from its supporting the Globe of the Head, having only a small Arch instead of a Body.

The upper and under Surfaces of the Arch, *marked* by the Ligaments which fix it to the Head and second Vertebra.

The back part of the Arch *hollow*, and *covered by a smooth Cartilage*, where it turns upon the Processus Dentatus of the second Vertebra.

The inner parts of the sides of the Vertebra, between the superior and inferior Oblique Processes, *marked* by the Lateral Ligaments which go to the Processus Dentatus, and by the Transverse Ligament which passes behind that Process.

The *Foramen Vertebrale*, larger than in any of the other Vertebræ, for receiving in its fore part the Tooth-like Process of the second Vertebra, and in its back part the beginning of the Spinal Marrow.

An *Arch* upon the back part of the Atlas, instead of a Spinous Process, *marked* by Muscles and Ligaments.

The *Superior Oblique Processes*, *oval*, *slanting*, and *hollow*, for receiving the Condyles of the Occipital Bone.

A *curved Fossa* under the outer and back part of each Oblique Process, for the passage of the Vertebral Arteries into the Head, and Tenth Pair of Nerves out of it.

The *Transverse Processes*, *longer* than in any other Cervical Vertebra, for the origin of several Muscles.

The *Connection* of the Atlas to the Occipital Bone, where the Head has its *flexion* and *extension*, but little other motion.

The second Vertebra, called *Dentata*, from the Tooth-like Process on the upper part of its Body.

The *Body* of this Vertebra *larger* than the rest, and of a *Conical* figure.

The fore part of the Processus Dentatus, *convex*, and *covered with Cartilage* where it turns upon the Atlas. It has the same appearance behind, where it moves upon the Transverse Ligament.

The *Sides* of this Process, *marked* by the insertion of the lateral Ligaments, and its point by the insertion of the perpendicular Ligament, which is fixed to the edge of the Foramen Magnum of the Occipital Bone.

The *Superior Oblique Processes* placed horizontally, and a little elevated in the middle, to be received into the hollow Inferior Oblique Processes of the Atlas, where the Head has its principal rotatory motion.

The *Spinous Process*, thick and strong, to give origin to the Muscles which assist in the extension and rotation of the Head, and turned down to allow these motions to be readily performed.

In the Fœtus, the Vertebra Dentata consists of four pieces, three of which are common to all the Vertebræ; the fourth is the Processus Dentatus, which is joined by Cartilage to the Body of the Bone.

The third, fourth, fifth, and sixth Vertebræ differing from each other chiefly in becoming larger in their descent.

The *seventh Cervical Vertebra*, approaching in form to the Dorsal Vertebræ.—The Spinal and Transverse Processes have no Bifurcation.

The *Dorsal Vertebræ*, commonly twelve in number, sometimes eleven only, have been met with, at other times thirteen have occurred.

The *Bodies* of the Dorsal Vertebræ, horizontal above and below, larger, sharper before, flatter at the sides, and more hollow behind, than those of the Cervical Vertebræ.

A *Pit*, lined with Cartilage at each side of their upper and under Edges, near the Transverse Processes, for the Articulation of the Heads of the Ribs.

The *Intervertebral Substances*, *thin* to admit only of little motion ; and *thinnest* anteriorly, to enlarge the Curve of the Spine, and increase the Cavity of the Thorax.

The Spinal Canal is here more Circular, but corresponding with the size of the Spinal Marrow,—is smaller than in any of the other Vertebræ.

The *Oblique Processes*, having nearly a perpendicular direction, the upper ones slanting forwards, and the under ones backwards.

The *Transverse Processes*, long, turned obliquely backwards, and enlarged at their outer extremity, where they are faced with Cartilage, to be articulated with the Tubercles of the Ribs.

The *Spinous Processes*, long, thick at the roots, but slender near the extremities, and pointing obliquely downwards over each other, by which the Spinal Marrow in this part is well protected.

The upper edge of each of the Spinous Processes of these Vertebræ, formed into a *Ridge*, which, in certain motions of the Spine, is received by a Groove in the under part of the Spinous Process of the Vertebra immediately above it.

The last peculiarity of Structure, with the others already mentioned, prevent the Dorsal Vertebræ from having much motion.

The Spinous Process becoming gradually larger and more oblique, from the fourth to the eighth or ninth, from which downwards, they are shorter and placed more horizontally, the undermost Vertebra of the Back resembling the uppermost of the Loins.

The Bodies of the four uppermost Dorsal Vertebræ, contrary to the general rule, becoming smaller as they descend, which allows the Trachea to divide at a sharp angle.

The *first Dorsal Vertebra*, having the whole of the Pit for the Head of the first Rib formed in it.

The *eleventh Dorsal Vertebra*, wanting the Articular Surface on its Transverse Process, and frequently has the whole Cavity for the Head of the eleventh Rib on its Body.

The *twelfth Dorsal Vertebra* receiving the whole Head of the last Rib, and having no Cartilaginous Surface on its Transverse Process.

The *Lumbar Vertebræ*, or *those of the Loins*, commonly five, seldom six, and still more seldom four in number.

The *Bodies* of the Lumbar Vertebræ larger and broader than those of the other two classes.

The *Intervertebral Substances*, the thickest of any, and most so at their fore part, by which the Spine is rendered convex there, for the Support of the Abdominal Bowels.

The *Oblique Processes*, remarkably deep, and placed upright, the Superior Oblique Processes of one Vertebra facing inwards, and receiving the Inferior Oblique Processes of the Vertebra above it, which are turned in the opposite direction.

The *Transverse Processes*, long, slender, and spread out from the Bone, to give origin to large Muscles, and to admit of free motion.

The *Spinous Processes*, short, large, and strong, and placed horizontally, with narrow edges above and below, and broad flat sides, giving origin to Muscles of great strength.

The *Spinal Canal*, larger than in the back, for the passage of the Cords of the Spinal Marrow, which form the Cauda Equina.

In consequence of the thickness of the Intervertebral Substances, and the situation of the Processes of the Lumbar Vertebræ, the motion of this part of the Spine is extensive, though not so much so as in the Neck.

The True Vertebræ give an erect posture to the Trunk of the Body; allow a sufficient and secure motion to the Head, Neck, and Trunk; conduct the Spinal Marrow; support and protect the Bowels, and other soft parts; and give Origin to the Longus Colli, Recti Capitis Anteriores Major et Minor, Rectus Capitis Lateralis, Lesser Muscle of the Diaphragm, Psoæ Magnus et Parvus, Rhomboideus, Splenius, Serrati Postici Superior et Inferior, Spinalis Dorsi, Complexus, Trachelo-mastoideus, Levator Scapulæ, Semi-spinalis Dorsi, Semi-spinalis Colli, Transversalis Colli, Levatores Costarum, Recti Capitis Postici Major et Minor, Obliqui Capitis Superior et Inferior, Interspinales Colli, Dorsi, et Lumborum, Intertransversales Colli, Dorsi, et Lumborum,—to Part of the Obliquus Internus, Transversalis Abdominis, Iliacus Internus, Trapezius, Latissimus Dorsi, Sacro-lumbalis, Longissimus Dorsi, and Multifidus Spinæ;—Insertion to the Longus Colli, Spinalis Dorsi, Semi-spinalis Dorsi, Multifidus Spinæ, Semi-spinalis Colli, Transversalis Colli, Cervicalis Descendens, Obliquus Capitis Inferior, Scaleni Anticus, Medius, et Posticus, Interspinales Colli, Dorsi, et Lumborum, Intertransversales Colli, Dorsi, et Lumborum,—to Part of the Splenius, Longissimus Dorsi, and Quadratus Lumborum.

FALSE VERTEBRÆ.

THE FALSE VERTEBRÆ, *composed* of the Os Sacrum and Os Coccygis.

OS SACRUM.

The Bone obtaining its name from its having been offered in Sacrifice.

The *triangular Form* of the Bone, with its pointed under extremity.

The *flat concave anterior Surface*, for enlarging the Cavity of the Pelvis.

The *under* and *fore part* forming a *turn*, called by some, the *Lesser Angle* of the Bone, and this turn varying much in different Subjects.

The *convex irregular Surface behind*, where strong Muscles arise, which assist in extending the Spine and Thigh.

Four transverse prominent Lines seen anteriorly, indicating the situation of the Cartilages which originally divided the Bone into five pieces.

The upper part of the Body of the first portion of the Os Sacrum, similar to that of the Vertebræ of the Loins, while the fifth portion corresponds with the first piece of the Os Coccygis.

The *Spinal Canal*, of a triangular form, of great size above, but becoming gradually smaller in its descent; corresponding to the size of the under end of the Spinal Marrow, termed *Cauda Equina*, which goes through it.

The *under* part of the Spinal passage, commonly *open* behind; the Canal being completed, in the Subject, by the addition of a strong Ligamentous Membrane. Sometimes the Canal is open through the whole length of the Os Sacrum.

The *Arch* at the sides and back part of the Spinal Canal, much thicker and stronger than in the true Vertebræ.

The *Oblique Processes*, excepting the two uppermost, all united together, and confounded with the Transverse Processes.

The *two superior Oblique-Processes* belonging to this Bone, facing backwards, to correspond with the two inferior Processes of the last Lumbar Vertebra.

A *large Oblong Process* on each side of the Bone, formed by the concretion of the outer ends of all the original Transverse Processes.

The upper lateral parts of the Bone, which correspond with the three superior Transverse Processes, divided into *two irregular Cavities* on each side, by a *perpendicular Ridge.*

The *anterior* of the two Cavities lined with *Cartilage*, which glues this Bone to the Os Ilium, and in such a manner as not to allow any motion.

The Cartilage which unites these Bones to each other is remarkably thin, but adheres so intimately to the Os Sacrum, that in separating that Bone from the Ilium, the Cartilage commonly comes with it, leaving the Ilium quite bare.

The *posterior* Cavity, *rough* and *irregular*, divided into two, by a Transverse Ridge formed by the union of their Oblique Processes; and in the recent Subject, full of *Ligamentous Fibres* and *Cellular Substance*, which are included in the general Capsular Ligament, and which also assist in fixing the two Bones to each other.

The portion of this process formed by the three uppermost Transverse Processes, remarkably thick and strong, while that belonging to the two last is much smaller, but irregular behind, where it gives attachment to the Ligament termed *Sacro-sciatic.*

Of the *Spinous Processes*, the three uppermost commonly *distinct*, but remarkably *short :* There is a great variety, however, in the number and appearance of the Spinous Processes in different Bones, and consequently of the length of the complete part of the Spinal Canal.

The two inferior Spinous Processes commonly *forked*, without meeting into a Spine, but leaving between them the opening already mentioned, for the under end of the Cauda Equina.

Sometimes the whole Spinous Processes are wanting.

Four Pair of large Holes on the *anterior Surface* of the Bone, at the end of the Lines already described, and *superficial Grooves* running out from the Holes, for the passage of the Sacral Nerves.

The Holes become smaller as the Bone descends, corresponding with the Nerves which pass through them.

Four Pair of Holes on the *posterior Surface*, not much smaller than those seen anteriorly, but so filled with Cellular Substance, and covered with Membranes in the recent Body, as only to admit small Nerves to pass out to the Muscles on the back part of the Pelvis, and minute Arteries to enter to the Cauda Equina.

At the root of each superior Oblique Process, anteriorly, an impression made where the last Lumbar Nerve passes out.

A *Notch* at the under end of each side of the Bone, or a *Hole* common to it and the Os Coccygis, for the passage of the last Spinal Nerve.

The *Substance* of the Os Sacrum, like that of the other Vertebræ, is very *spongy*, and covered only by a thin external Plate; this, however, is rendered considerably stronger by a Ligamentous Membrane which adheres to it.

The

The *Connection* of this Bone above to the last Lumbar Vertebra, in the same manner as the other Vertebræ are connected to each other, and the same motion allowed as to these Vertebræ.—The projection formed between these two Bones anteriorly, obtains the name of *Promontory*, or *Greater Angle* of the Os Sacrum.

The Os Sacrum serves as the common base and support of the Trunk of the Body, guards the Nerves issuing from the under end of the Spinal Marrow, defends the back part of the Pelvis, and gives origin to Muscles moving the Trunk and Thigh, viz. to the Curvator Coccygis, to Part of the Latissimus Dorsi, Sacro-lumbalis, Longissimus Dorsi, Obliquus Externus Abdominis, Multifidus Spinæ, Gluteus Maximus, and Pyriformis.

In the Fœtus, the Os Sacrum consists of five distinct Vertebræ, each of which has several Osseous Nuclei, and the pieces have Intervertebral Substances similar to those of the True Vertebræ.

At this time, each of the Vertebræ of the Os Sacrum, as well as of the True Vertebræ, consists of a Body and two lateral parts, which are joined together by Cartilages.

The Cartilages between the different Vertebræ of the Os Sacrum continue till about the time of Puberty, when they are absorbed.

Os Coccygis, vel Ossa Coccygis.

The Os Coccygis, or *Rump-bone*, forming an Appendage to the under end of the Os Sacrum.

The *Situation* of this Bone at the under end of the Os Sacrum.

Its *Figure, broad* and *flat above,* and *tapering below, convex behind,* and forming a *Curve forwards,* to defend it from injury when a person is in a sitting posture.

The *four pieces* of which it is composed in young Subjects.

The Bone is considered by some Authors as being formed of *three* pieces; and then the Os Sacrum is said to have *six.*

The *first* or *uppermost piece* by much the *largest,* with Shoulders reaching farther than the end of the Os Sacrum. This is regarded by some as a proper distinction between the Os Coccygis and Os Sacrum.

From the back part of the Shoulders, *two Cornua* frequently ascend to join the forked Spinous Processes at the end of the Os Sacrum, and form a passage for the transmission of the last Pair of Spinal Nerves.

The *three lower Bones* of the Os Coccygis becoming gradually smaller, the *fourth* terminating in a *rough point.*

Cartilage is interposed between the different pieces of this Bone in young Subjects, joining them together, after the manner of the Vertebræ; allowing motion upon each other forwards and backwards, but chiefly between the first and second pieces; and a greater degree of motion there in the Female than in the Male.

In advanced life, but earlier in Men than in Women, the pieces grow together so as to admit of no motion; But this takes place much later between the first and second, than between the other pieces.

The *Substance*, like that of the Os Sacrum, is *spongy;* but this Bone differs from the Sacrum in having no passage for the Spinal Marrow, nor Holes for Spinal Nerves.

The *connection* of this Bone, in young Subjects, to the Os Sacrum, by *Cartilage*,—in old People, by an *union* of Substance.

The Surface of the Bone is covered by a strong Ligament, which adds to its strength; and its sides give rise to numerous Muscular Fibres, which, while they derive their origin from it, serve at the same time to protect it.

The Os Coccygis sustains the Intestinum Rectum, contracts the Inferior Opening of the Pelvis, and assists in supporting the Rectum, Bladder, and Uterus.

It gives origin to the Sphincter Ani, and to part of the Gluteus Maximus, Insertion to the Coccygeus, Curvator Coccygis, and to part of the Levator Ani.

In the Fœtus, the Os Coccygis is almost entirely composed of Cartilage; but the different processes can readily be distinguished from each other by their form.

PELVIS.

PELVIS.

HERE observe,

The PELVIS or Bason, situated at the lower part of the Trunk, and formed by the Os Sacrum, Os Coccygis, and two Ossa Innominata.

OS INNOMINATUM,

Vel OS COXÆ.

The *Situation* of the Os INNOMINATUM, in the fore part and side of the Pelvis, and in the under and lateral part of the Abdomen.

The size the largest of all the Bones of the Skeleton.

The *Division* of the Bone, in Children, and to the age of Puberty, into Os Ilium, or Haunch-bone, Os Ischium, or Hip-bone, and Os Pubis, or Share-bone.

In the Adult, the three Bones are *ossified together*, but retain their original names.

OS ILIUM.

The *Os Ilium*, or Iliac part of the Os Innominatum, the largest of the three pieces, forming the upper part of the Os Innominatum, and spreading out, to assist in supporting the contents of the Abdomen.

The *Dorsum*, or *outer Surface* of the Bone, depressed at the fore part, raised farther back, and concave behind, the whole giving origin to the Glutei Muscles, or Extensors of the Thigh.

The *Crista* or *Spine*, or upper semicircular edge of the Bone, for the attachment of the Oblique and Transverse Abdominal Muscles.

In the recent Subject, the Spine is covered with a Tendinous and Cartilaginous crust, that separates in macerating the Bone.

The *anterior-superior Spinous Process*, or anterior extremity of the Spine, for the attachment of the Sartorius, the Tensor Vaginæ Femoris, and of Poupart's Ligament, or Crural Arch.

The *anterior-inferior Spinous Process*, a little below the former, for the attachment of the Rectus Femoris.

Between the two anterior Spinous Processes, a Notch for lodging the beginning of the Sartorius Muscle.

The *two posterior Spinous Processes*, at the back part of the Spine, less considerable than the two anterior; partly for the origin of Muscles of the Back, but chiefly for the attachment of Ligaments which belong to the Joint between this Bone and the Os Sacrum. The outside of the posterior Spinous Processes flat and rough, where part of the Gluteus Maximus and Pyriformis take their origin.

The *Notch* of the Os Ilium under the posterior-inferior Spinous Process, for the passage of the Pyriform Muscle, Sciatic Nerve, and Blood-vessels.

The *Venter*, or *inner concave Surface* of the Bone, for the attachment of one of the Flexors of the Thigh, termed *Iliacus Internus*, and the support of a portion of the Intestinum Ilium and Colon.

A *Passage* in the Venter, near the Linea Innominata, and another in the Dorsum towards its anterior part, for the principal Medullary Vessels of the Bone. Besides these, different Foramina are seen, of less consideration, for admitting Vessels into the Substance of the Cancelli.

A *Depression* at the inside of the anterior-inferior Spinous Process, where the Flexor Muscles of the Thigh, viz. the Iliacus Internus and Psoas Magnus, pass, with the anterior Crural Vessels and Nerve.

The *Linea Innominata*, vel *Linea Ilio-pectinea*, at the under part of the Venter of the Bone, forming the lateral portion of what is termed *Brim* of the Pelvis, and the line of division between the Pelvis and Abdomen.

Into the Iliac Portion of the Linea Innominata, the Tendinous Expansion continued from the Psoas Parvus is inserted.

The *inner* and *back part* of the Bone, *rough* and very *irregular*, the posterior portion of this irregular surface projecting behind the Os Sacrum, and giving origin to some of the large Muscles of the Back; the middle being for the attachment of Ligaments which go to the Os Sacrum, and the anterior for the firm connection which subsists between this Bone and the Cartilage which glues it to the Os Sacrum.

The circumference of this rough and irregular surface gives attachment to the Capsular Ligament of the Joint.

The *under*, *fore*, and *outer part* of the Bone, forming the upper and back part of the Acetabulum, or Cavity for the articulation of the Thigh-bone.

Os ISCHIUM,

Or Ischiatic part of the Os Innominatum.

The *Situation* of the Os Ischium in the lowest part of the Pelvis.

Its *Figure irregular;* its *size* next to that of the Os Ilium.

The *upper thick posterior part* of the Bone, forming the under and largest portion of the Acetabulum.

The *Spinous Process* sent back from the upper part of the Bone, for the attachment of Muscles,—and of the superior Sacro-sciatic Ligament, which completes the Notch of the Os Ilium into an Iliac Foramen.

The outer Surface of the Bone, at the root of the Spinous Process, *hollow* for the passage of the Pyriformis.

Under the Spinous Process, a *Sinuosity*, which, in a recent Subject, is covered with Cartilage where the Tendon of the Obturator plays as on a Pulley, in its way from the inner side of the Pelvis to the Thigh-bone.

Below the Acetabulum, the *Cervix* of the Bone, where the Tendon of the Obturator Externus is lodged.

The *Tuberosity*, or *Tuber Ischii*, below the Cervix of the Bone, which is covered with Cartilage that is separated by maceration.

The *upper part* of the Tuber placed obliquely, and giving attachment to the Geminus Inferior, to the under Sacro-sciatic Ligament, and to the largest Flexor Muscles of the Thigh, consisting of the long Head of the Biceps Flexor Cruris, Semi-tendinosus, and Semi-membranosus.

The external anterior Margin of the Tuberosity forming an *obtuse Ridge*, which gives rise to the Quadratus Femoris.

The thinner and more scabrous part of the Tuber, which has a curved direction, is what we rest upon in sitting. It gives origin to the Crus Penis in the Male, to the Crus Clitoridis in the Female, and to part of the Adductor Magnus Femoris.

The Tuberosity of the Bone contracting and going upwards and inwards to form the *Crus*, which is united to that of the Os Pubis by an accretion of Substance. The Crus impressed on the outer side by the origin of the Adductor Magnus Femoris, and on the inner side by the Crus and Erector Penis in the Male, and the Crus and Erector Clitoridis in the Female.

OS PUBIS, vel OS PECTEN,

Or Pubal part of the Os Innominatum.

The *Situation* of this Bone at the upper and fore part of the Pelvis.

Its *Size*, the least of the three portions of the Os Innominatum.

Division of the Bone into two Branches, an horizontal and a descending.

The *thickest* and *strongest* part of the Bone, forming the upper and fore side of the Acetabulum.

The upper part of this portion of the Bone formed into a kind of ridge by its junction with the Os Ilium.

The *upper* part of the Bone becoming smaller where it is flattened above, and rendered smooth by the passage of the Flexor Muscles of the Thigh, and of the anterior Crural Vessels and Nerves.

The upper and inner part of the Bone increasing in size, and forming the rough *Crest* or *Angle*, where the Rectùs and Pyramidalis, and the inner end of POUPART's Ligament, are attached.

A *Ridge*, or *Spine*, extended from the outer and fore part of the Crest, along the upper and inner edge of the Bone, to form, with a similar Ridge of the Os Ilium, the *Linea Ilio-pectinea*, *Brim*, or upper opening of the Pelvis.

This Ridge is described by some Authors as being sometimes so sharp, as to injure the parts which lie immediately contiguous to it.

Another *Ridge*, from the Crest or Angle, extending downwards and outwards towards the breach in the fore part of the Acetabulum.

A *Cavity* between these Ridges, for the origin of the Pectineus.

Immediately below the undermost of the two Ridges, the Bone having a *twisted appearance*, and a *Notch* which is formed into a Hole in the Subject, by the addition of the Obturator Ligament, for the passage of the Obturator Vessels and Nerves.

The *inner* end of the Bone *rough* and *unequal*, but covered with a Ligamentous Cartilage, which, in fresh Bones, joins the two Ossa Pubis so firmly together, as to prevent them from moving upon each other.

The inner part of the Bone broad, and depressed before, where it gives origin to part of the Adductor Muscles of the Thigh.

The inner part of the Bone becoming narrower, and ending in the *Crus*, which goes downwards to join the Crus of the Os Ischium, and form, along with that Crus, one side of the Arch of the Pubis.

The *Foramen Ovale*, vel *Thyroideum*, passing downwards and outwards, and of a triangular shape, with the angles blunted. It is formed by the Os Pubis and Os Ischium, and in the Subject is filled, excepting at the Notch above mentioned, by a Membranous Ligament, which gives rise to a large share of the Obturator Muscles.

The *Acetabulum*, or *Cavity*, (compared to a Vinegar measure used by the Ancients), placed farther out and a little higher than the Foramen Thyroideum, and formed by the three pieces which compose the Os Innominatum, in such a manner, that the Os Ilium constitutes near two-fifths, the Os Ischium more than two-fifths, and the Os Pubis one-fifth of that Cavity.

The *Cavity* of the Acetabulum very deep, especially behind, and made still deeper in the Subject, by its Brim being tipped with a Cartilaginous Ligament.

Round the outer edge of the Brim, the Bone *rough*, where the Capsular Ligament of the Joint is fixed.

A *Breach* in the inner and fore part of the Acetabulum, which, in the Subject, has a strong Ligament stretched from one end of that Notch to the other, but leaving a Hole behind for containing part of the Substance called *Gland of the Joint.*

The *Cavity* of the Acetabulum lined with Cartilage, excepting at its under, inner, and fore part, where there is a rough Depression for containing the greater part of the Substance mentioned above.

The *Brim*, *Introitus*, or *upper Opening* of the Cavity of the Pelvis, approaching in the Male to a circular, and in the Female to an oval form.

The *Inferior Opening* is large in the Skeleton, but in the Subject in a great measure is filled up by Ligaments and Muscles, which support and protect the contained parts, and leave only the passages from the Bladder of Urine and Rectum in the Male, and, together with these, the passage from the Uterus in the Female.

In what is considered as a *standard* Female Pelvis, the distance between the Os Sacrum and Os Pubis, at the *Brim*, is found to be between four and five inches, and that between the two Ossa Ilia between five and six inches. In the *Exitus*, or inferior opening, the proportions are reversed, the distance between the Symphysis Pubis and Os Coccygis being longer than that between the Ossa Ilia. The depth of the fore part of the Pelvis, at the Symphysis of the Pubis, measures about an inch and a half, behind it is six inches, and at the sides three inches and a half. The Pelvis may vary from the above dimensions according to the size and proportions of the Body, which may differ somewhat in the different nations, yet be well formed; or it may vary from disease either of the Bones or Viscera, and then it is considered as distorted.

The *Substance* of the Iliac part of the Os Innominatum is Cellular, with a thin external Table, which, in some old people, is so much affected by Muscular action about its middle, as to become transparent. The other two portions of the Os Innominatum are Cellular, as in other flat Bones, but some parts of the external Table are of considerable thickness and strength.

The Ossa Innominata, *joined behind* to the Os Sacrum by a *thin Cartilage*, and by *strong Ligaments*, so as to have no motion; the Joint obtaining the name of *Posterior Symphysis* of the Pelvis, or *Sacro-iliac Symphysis.*

The *Connection* of these Bones to each other anteriorly, by a Ligamentous Cartilage and Ligaments, which also prevent motion here. This connection is termed *Symphysis Pubis*, or *Anterior Symphysis* of the Pelvis.

The Os Ilium gives Origin to the Quadratus Lumborum, Glutei Medius et Minimus, Tensor Vaginæ Femoris, Sartorius, Rectus Femoris,—to Part of the Latissimus Dorsi, Longissimus Dorsi, Sacro-lumbalis, Obliquus Externus, Obliquus Internus, et Transversalis Abdominis, Pyriformis, Gluteus Maximus, Multifidus Spinæ, and Iliacus Internus.

The Os Ischium gives Origin to the Gemini, Semitendinosus, Semi-membranosus, Long Head of the Biceps Flexor Cruris, Quadratus Femoris, Erector Penis, Erector Clitoridis, Transversalis Perinei, and the Coccygeus;—to Part of the Adductor Magnus Femoris, Obturatores Externus et Internus, and Levator Ani.

The Os Pubis gives Origin to the Rectus Abdominis, Pyramidalis, Pectineus, Gracilis, Adductores Longus et Brevis Femoris,—to Part of the Adductor Magnus, Obturatores Externus et Internus, and Levator Ani; —Insertion to the Psoas Parvus, and part of the Obliquus Externus Abdominis.

USE OF THE PELVIS.—It constitutes the Basis of the Trunk, and forms Sockets for the Thigh-bones to move in. It contains the Bladder of Urine and the Rectum in the Male, and, together with these, the Uterus in the Female. It gives Origin to the Muscles which extend the Trunk, and Insertion to those which bend the Body. It sends off the principal part of the Muscles which move the Thigh, and gives passage and protection to Blood-vessels, and to some of the largest Nerves of the Body.

In the Fœtus, the Spine of the Os Ilium, and that part of the Bone which belongs to the Acetabulum, are Cartilaginous. The Spinous Process, the Tuberosity, and Crus of the Os Ischium, the Crus of the Os Pubis, and that portion of it which forms the Acetabulum, are also in a Cartilaginous state. The shape of the Cavity of the Pelvis, at this period, is altogether different from that in the Adult, the under being wider than the upper part.

THORAX.

THE circumstances to be attended to in this part of the Skeleton are,

The *Thorax*, formed of the Sternum or Breast-bone before, of the Ribs on each side, and of the Dorsal Vertebræ behind.

The general *figure* of the Thorax approaching that of a *Cone*, but left open above for the passages to the Lungs and Stomach, and for the great Blood-vessels.

The *Lower Part* of the Thorax *slanting*; the *fore part* being considerably shorter than it is behind.

The *Under Margin* on each side, forming a curved line, the convex side of which is turned downwards.

The under end of the Thorax is occupied, in the Subject, by the *Diaphragm*, which forms an arched partition between it and the Abdomen, with the convex side upwards.

COSTÆ.

The *Situation* of the Costæ, or Ribs, *slanting* downwards with respect to the Spine.

Their *Number*, in the Male as well as in the Female, commonly *twelve* on each side, though sometimes thirteen, and at other times only eleven; their number always corresponding with that of the Dorsal Vertebræ.

Their *Figure*, *convex* externally, by which their strength is increased; and *concave* and *smooth* internally, with their flat sides turned towards the Lungs, which they protect.

The *Head* of each Rib formed into a *Ridge* and *two hollow Surfaces* covered with Cartilage, to be articulated with the Bodies of two Vertebræ, and their intermediate Cartilage.

Round the Head, the Bone *spongy*, for the attachment of the Capsular Ligament of the Joint.

The *Tubercle* of the Rib, at a little distance from its Head, and placed posteriorly, with a flat Cartilaginous Surface and irregular Edge, to be articulated to the Transverse Process of the undermost of the two Vertebræ, to which the Head of the Rib is joined.

The *Cervix* of the Rib, between its Head and Tubercle, of a roundish form.

Another *small Tubercle* in most of the Ribs, at the outer side of the former, for the attachment of Ligaments which fix the Ribs to each other, and to the Transverse Processes, and also for the insertion of the outer Slips of the Longissimus Dorsi.

Beyond the Tubercle, the Rib rendered *flat* behind, by the Sacro-lumbalis.

The *Angle* of the Ribs to which the Sacro-lumbalis is fixed, where the Bones are about to bend, to form the lateral part of the Thorax.

The Rib becoming *broader* and *flatter* at the lateral part of the Thorax, and the flat Surface opposed to the Lungs.

The *upper Edge* of the Rib, *round* where the Intercostales are fixed.

The *under Edge*, *sharp* where the Intercostalis Externus has its Origin.

A *Fossa* at the inside of the under Edge, for lodging the Intercostal Vessels and Nerves. The upper Edge of the Fossa gives Origin to the Intercostalis Internus.

The *Fossa wanting* towards the extremities of the Ribs; the Vessels not being in contact with them behind, and too small to impress them anteriorly.

An *Oval Pit* in the anterior extremity of each Rib, for receiving the Cartilage which runs from it towards the Sternum.

The *Cartilages* of the Ribs, placed between them and the Sternum, or connected to each other, or lying loose among the Muscles.

The Cartilages, like the Ribs, *flat* on their outer and inner Surfaces, and *smooth* where they are opposed to the Lungs.

The Cartilage of each Rib, forming, with the Rib itself, a *Curve*, the concave part upwards.

And with the Sternum, an *obtuse Angle* above, and an *acute one* below.

The Cartilages yield to the motions of the Ribs, and enable them to return to their former position, when the Muscles of inspiration cease to act. The Cartilages of the Ribs, in old people, are frequently ossified.

The Ribs are *connected behind* to the Vertebræ by a double articulation, and *before* to the Sternum by the Cartilages, or by the Cartilages to each other, in such a manner as to allow motion upwards and downwards,

though

though only a small degree in any single Rib, and that towards its middle; but no motion in any other direction.

PECULIARITIES OF THE RIBS.

The *first Rib* the *most crooked;* from this downwards the Ribs become gradually straighter.

The *uppermost Ribs* approaching nearest to the horizontal situation; their obliquity, with respect to the Spine, increasing as they descend, and their anterior extremities becoming more distant from each other.

The *Cartilages* of the Ribs, like the Ribs themselves, becoming gradually longer from the first to the seventh, but, contrary to what happens in the Ribs, approaching nearer to each other in their descent.

The *length* of the Ribs, *increasing* from the first to the seventh, and then *decreasing* to the twelfth.

The *distance* between the Heads of the Ribs and their Angles, increasing to the ninth Rib, corresponding with the breadth of the Sacro-lumbalis which covers them.

The seven uppermost Ribs having their Cartilages joined to the Sternum, and opposed to the Heart and Lungs, considered as the *Custodes,* or *Guards of Life,* hence termed *True Ribs.*

The five inferior, not reaching the Sternum, termed *False Ribs.*

The *Cartilages* of the False Ribs, *shorter* as they descend, and more flexible than those of the True Ribs.

The *first Rib* placed in a horizontal situation, with one of the flat sides facing upwards, and the other downwards, in consequence of which one of the edges is turned outwards, and the other in the contrary direction.

The *posterior Extremity* of the first Rib, articulated only with the first Vertebra of the Back.

A *flat Surface* upon the upper part of this Rib, where the *Subclavian Vessels* pass over it to the Arm.

The *Fossa* for the Intercostal Vessels and Nerves wanting at the edge of this Rib, on account of their running at a distance from this part of the Bone.

The anterior Extremity of the first Rib united to the Sternum at nearly right angles, and its Cartilage so short, so firmly fixed, and so frequently ossified, as to be only moved with the Sternum.

The *Cartilages* of the two under true Ribs, and three upper False Ribs, commonly *joined* to each other by cross Cartilages, or by an union of Substance, though sometimes this union takes place among a smaller number than that mentioned above.

The *Cartilage* of the eighth Rib sometimes joined to the Sternum, and then forming one of the True Ribs.

The *Head* of the eleventh Rib, *having no Tubercle* for articulation, being only loosely joined to the Transverse Process.

The twelfth Rib *much shorter* than the rest. Its Head is only joined to the twelfth Vertebra of the Back. It has no Tubercle, nor articulation with the Transverse Process; neither has it any Fossa at its under edge, the Vessels and Nerves running some way below it.

The *Anterior Extremities* of the eleventh and twelfth

Ribs, not joined to each other, nor to any other Rib, but lying loose among the Muscles; hence these Ribs sometimes named *Floating Ribs.*

The Substance of the Ribs, like that of the Vertebræ, is Cellular, and only covered with a thin external Plate, which becomes somewhat thicker towards the Vertebræ.

In the Fœtus, the Heads and Tubercles of the Ribs have Cartilages, part of which become thin Epiphyses. After Birth, the Bodies of the Ribs encroach gradually on the Cartilages; hence the Cartilages of the Ribs are proportionally shorter in Adults than in Children.

The Ribs give form to the Thorax, and compose a considerable portion of the Walls of the Abdomen. They cover and defend the Heart and Lungs, and assist the latter in performing respiration.

They give Origin to the Serratus Magnus, Pectoralis Minor, Intercostales Externi et Interni, Subclavius, the three Scaleni, Accessorii ad Sacro-lumbalem,—to Part of the Diaphragm, Sterno-hyoideus, Sterno-thyroideus, Pectoralis Major, Latissimus Dorsi, Obliquus Externus, et Transversalis Abdominis;—Insertion to the Intercostales Externi et Interni, Levatores Costarum, Sterno-costalis, Serrati Posticus Superior et Inferior, Sacro-lumbalis,—to Part of the Longissimus Dorsi, Quadratus Lumborum, Obliquus Internus, et Rectus Abdominis.

STERNUM.

The *Situation* of the Sternum in the fore part of the Thorax.

The Sternum, *thick* and *broad above*, and *thin* and *narrow below*.

The *outer Surface flat*.

The *inner Surface slightly hollowed*, to enlarge the Cavity of the Thorax.

Pits upon each edge of the Sternum, to receive the Cartilaginous ends of the seven True Ribs.

The *Pits* at a considerable distance from each other above, but becoming gradually nearer as they descend.

The *Cancelli* of the Sternum, covered only by a thin external Plate, but this rendered stronger by a Tendinous Membrane investing it in the recent state.

Three Pieces composing the Sternum, in a person of middle age, and these joined together by Cartilage.

The different Pieces of this Bone are frequently found *ossified together* in old people.

The *upper piece* of the Sternum, of a somewhat *triangular* figure, compared to that of a Heart as painted on playing-cards, but appearing as if cut across below.

The *upper* and *back part hollowed*, to make way for the Trachea.

The *upper Corners*, *thicker* and *stronger* than the rest of the Bone, with a *Cavity* in each, lined with Cartilage, for receiving the ends of the Collar Bones.

Under these Cavities, the Bone becoming *thinner*, and having a *Pit* upon each side, for receiving the Cartilage of the first Rib.

Part of the *Pit* in each of the *under Corners* of the first piece, for the Cartilage of the second Rib.

The *second piece* of the Sternum, of an *oblong* form, but a little broader below than above, and considerably longer than the former.

The second piece *varies* considerably in shape in different Subjects, being frequently as broad above as below, and sometimes considerably broader. It is nearly of the same thickness throughout.

Complete Pits upon the edges of this piece, for the Cartilages of the third, fourth, fifth, and sixth Pair of Ribs, and part of the *Pits* for those of the second and seventh.

Lines extending across the Bone, between the Pits, denoting the original marks of division of this piece.

The *Connection* of the second piece of the Sternum to the first by Cartilage, which, in the earlier period of life, allows some yielding, but this becoming gradually less as the person advances in life.

The *third piece* of the Sternum *Cartilaginous* in a young Subject, and pointed like a broad-sword, hence termed *Cartilago Ensiformis.*

The Adult has this piece commonly *ossified* in the middle, and *cartilaginous* at the edges.

The *Size* of this piece *much less* than that of the other two.

Only *one half* of the Pit, for the Cartilage of the seventh Rib, formed in each side of this piece.

The *Variations* of the Cartilago Ensiformis are considerable in different Subjects;—for, instead of the common form, it is sometimes narrow like the point of a small sword, or turned obliquely to one side, or forwards, or backwards, or forked at the point, or perforated in the middle.

The Sternum is *joined* by Cartilage to the seven upper or True Ribs, on each side, and by an inter-articular Cartilage to the anterior ends of the Clavicles.

The Sternum defends the Heart and Lungs, assists in the formation of the Thorax, sustains the Mediastinum, is a medium of attachment to the Ribs, and serves as a Fulcrum or point on which the Clavicles roll.

It gives Origin to the Sterno-costalis,—to Part of the Pectoralis Major, Sterno-mastoideus, Sterno-hyoideus, Sterno-thyroideus, and Diaphragm;—Insertion to part of the Rectus, Obliquus Internus, et Transversalis Abdominis, and Intercostales Interni.

In the Fœtus, this Bone is composed of seven or eight pieces, but the number of these varies in different Subjects. By degrees the pieces unite, till at length they form the three Bones already described.

SUPERIOR EXTREMITIES.

WE find here,

Each *Superior Extremity*, composed of the Bones of the *Shoulder*, *Arm*, *Fore-Arm*, and *Hand*.

SHOULDER.

The *Shoulder*, consisting of the *Clavicle* or *Collar-Bone*, and *Scapula* or *Shoulder-Blade*.

CLAVICLE.

The *Situation* of the Clavicle, between the upper part of the Sternum and top of the Scapula, and placed almost horizontally.

The Sternal or internal Extremity, *triangular*, and *larger* than the Body, with one of the angles elongated backwards where it gives origin to a Ligament extended between the two Clavicles.

The Surface next the Sternum, covered with Cartilage, and *irregularly hollowed*, to correspond with the inter-articular Cartilage, which, with the Capsular Ligament of this Joint, allows a small degree of motion in all directions.

Round the edge of the Cartilaginous Surface, the Bone marked by the strong Ligaments, which fix it to the Sternum.

The Body of the Bone next the Sternum *bent forwards*, and that next the Scapula *turned back*, the whole resembling an Italic *ſ*, or a key used by the Ancients; from which, or from the support, like a beam, it gives to the Shoulder, its name is derived.

The Upper part of the Clavicle, next the Sternum, *rounded*, the extremity, next the Scapula, *thin* and *flat* where it lies over the Joint of the Humerus.

Over the Bone in general rough marks are observed, for the attachment of Muscles and Ligaments.

The under Surface *hollow*, for lodging a portion of the Subclavius.

In the under Surface, and near the middle, one or more small Canals, leading obliquely outwards, for the passage of the Medullary Vessels.

The *External* or *Scapulary Extremity*, oval and flat, and tipped with Cartilage, to be articulated with the Acromion of the Scapula.

Near the back part of the Scapulary Extremity, a *Tubercle*, for the attachment of a strong Ligament, which connects this Bone to the Coracoid Process of the Scapula.

The Substance of this Bone is like that of other long round Bones, but the external Table is of considerable thickness and strength.

The Clavicle supports the Shoulder at a proper distance from the Thorax, and thereby renders the motions of the Arm more extensive. It gives attachment to several Muscles, and defence to large Vessels and Nerves.

It gives origin to Part of the Sterno-cleido-mastoideus, Sterno-hyoideus, Pectoralis Major, and Deltoides;—Insertion to the Subclavius, and to Part of the Trapezius.

In a Fœtus the Clavicle is completely formed.

SCAPULA.

The *Situation* of the Scapula, upon the upper and back part of the Thorax, at some distance from the Ribs, the interval being filled up by a cushion of flesh composed of the Serratus Magnus and Subscapularis.

The *shape* of the Scapula *triangular*, with one of the angles placed downwards.

The *Venter*, or inner Surface, *concave*, corresponding with the convexity of the Ribs, and marked with *Ridges* and *Depressions* which run in a radiated manner towards the Cervix of the Bone, pointing out the attachments of the Subscapularis, and the impressions made by that Muscle.

The *Dorsum*, or outer Surface of the Scapula, rendered *convex* in some parts, and *concave* in others, by the action of the Muscles which cover it.

The Body of the Scapula is *remarkably thin*, and, in an old person, *transparent*.

The three *Edges* of the Bone *thick* and *strong*, and termed *Costæ*.

The Superior or Cervical Costa the *shortest* of the three, and placed nearly opposite to the second Rib.

A *Semilunar Notch*, which is sometimes converted into a Foramen, near the fore part of the superior Costa, for the passage of the superior Scapulary Vessels and Nerve.

The *inferior* or *anterior Costa*, extending obliquely downwards and backwards, between the third and eighth Ribs.

The inferior Costa *impressed* where it gives origin to the Teres Minor, the long Head of the Triceps Extensor Cubiti, and Subscapularis.

The *posterior Costa*, or *Base* of the Bone, placed obliquely with respect to the Vertebræ, the upper end being considerably nearer them than the under.

The *upper part of the Base*, above the large Ridge termed Spine, running obliquely forwards to the upper angle, and giving attachment to the Levator Scapulæ.

The portion of the Base under the Spine, *rough*, for the insertion of the Rhomboides, and Serratus Major Anticus.

The *inferior Angle* very acute, and marked behind by the passage of the Latissimus Dorsi, and the origin of the Teres Major.

The *superior Angle* approaching to a right Angle.

The *anterior Angle*, forming the *Cervix* or *Neck*, which descends from the Semilunar Notch, and supports the *Head* of the Bone, which is considered as one of its Processes.

The *Glenoid* (*i. e.* Shallow) *Cavity*, placed on the fore part of the Head of the Bone, and lined with Cartilage for the articulation of the Os Humeri.

The Cartilage lining this Cavity thick at the edges, but thin toward the centre, by which it is rendered deeper, for receiving the Ball of the Os Humeri.

The *shape* of that Cavity, resembling an Egg cut longitudinally, with the large end uppermost, but so shallow as to receive only a small portion of the Ball of the Os Humeri, the rest of the Ball being contained in the Capsular Ligament.

The *Spine*, or great Ridge, running across the Dorsum of the Bone, dividing it into a small upper and large under Surface, and giving origin to part of the Spinati.

The Spine, *small* at its beginning, *hollowed* and *curved* laterally by the action of Muscles, and becoming *higher* and *broader* in its course forwards.

A *triangular Space*, between the root of the Spine and base of the Bone, where part of the Trapezius is fixed.

At the under side of the Spine near its base, a passage for the principal Medullary Vessels; and in the thicker parts of the Bone numerous other, but smaller passages, which answer the same purpose.

The *Fossa Supra-spinata*, or Cavity above the Spine, for the Origin of the Supra-spinatus.

The *Fossa Infra-spinata*, or space under the Spine, for the Origin of the Infra-spinatus. The under part only of this space is a real Fossa, the rest of the Bone here being somewhat convex.

The Spine becoming broad and flat, and terminating in a point at its anterior extremity, where it is termed *Acromion*, extremity, or top of the Shoulder.

The under Surface of the Acromion, *hollow* for the passage of the Spinati, which run to the upper end of the Os Humeri.

The *Situation* of the Acromion over the upper end of the Humerus, which, together with the Ligaments, contributes to the protection of the Joint.

The anterior edge of the Acromion, *tipped with Cartilage* for its articulation with the outer end of the Clavicle.

The *Coracoid*, or *Crow's-beak-like Process*, arising from the Neck of the Bone, and making a curvature forwards, so as to leave a hollow at its root for the passage of the Subscapularis.

The *Point of this Process*, which gives Origin to the Pectoralis Minor, short Head of the Biceps, the Coraco-brachialis, and to a strong Ligament which passes transversely from its side, to be fixed to the Acromion, for the protection of the Joint.

At the upper part of the root of this Process, a small Tubercle, which gives attachment to a Ligament of the Clavicle.

The *Substance* of the Bone, very unequal in thickness; for the Inferior Costa and Processes are thick and strong, while the Body is so pressed by its own Muscles, especially in old people, as to become in many parts transparent.

The Scapula is *joined* to the Clavicle by Ligaments of such strength, as only to allow between these two Bones a small degree of motion, and that chiefly of a twisting nature; but the Scapula is so connected by Muscles to the Head, Os Hyoides, Trunk, and Arm, as to have motion upwards, downwards, and to either side, and, through the medium of the Clavicle, to be rolled upon the top of the Sternum.

The Scapula serves as a support to the Arm, forms a socket for the Arm-bone to move in, and has numerous Muscles so attached to it, as to assist in enabling the Arm to act freely in all directions. It also serves as a defence to the back part of the Thorax, and is fixed in such a manner by the surrounding parts, as to be capable of sustaining Bodies of great weight.

It gives Origin to the Supra-spinatus, Infra-spinatus, Teres Major, Teres Minor, Subscapularis, Biceps Flexor Cubiti, Omo-hyoideus, Coraco-brachialis, Long Head of the Triceps Extensor Cubiti,—and to Part of the Deltoides;—Insertion to the Rhomboideus, Pectoralis Minor, Serratus Magnus, Levator Scapulæ, —and to Part of the Trapezius.

In the Fœtus, the Base, Acromion, Coracoid Process, and Head of the Scapula, are Cartilaginous. The three first are afterwards joined as Epiphyses; while the Head, with the Glenoid Cavity, is gradually produced from the Body of the Bone.

ARM.

The ARM, consisting of a single Bone, the

OS HUMERI, vel OS BRACHII.

The *Os Humeri*, the longest and strongest of the Bones of the Superior Extremity.

The *Situation* of this Bone at the side of the Thorax, and under the Scapula.

The *Ball* or *Head* of the Os Humeri, forming a small segment, or about a third part, of a large sphere, and this covered with Cartilage, and placed obliquely at the upper, inner, and back part of the Body of the Bone, to correspond with the Glenoid Cavity of the Scapula.

The *Cervix* or *Neck*, surrounding the edge of the Ball, and forming a superficial Fossa, where the Capsular Ligament is fixed.

Numerous Holes round the upper end of the Bone, for the insertion of the Fibres of the Capsular Ligament, and for the passage of Blood-vessels into the Bone.

A long *Groove* or *Fossa*, lined with a Cartilaginous and Tendinous Crust, in the upper and fore part of the Bone, for lodging the Tendon of the long Head of the Biceps, which descends from the upper edge of the Glenoid Cavity of the Scapula.

The *smaller Tubercle*, placed at the upper and inner side of the above-mentioned Groove, for the attachment of the Subscapularis.

The *larger Tubercle*, opposite to the former, and on the outer side of the Groove, for the attachment of the Muscles which cover the Dorsum of the Scapula; viz. the two Spinati, and Teres Minor.

A *Ridge* continued down from each Tubercle along the sides of the long Fossa, for the insertion of Muscles coming from the Trunk of the Body, or from the Scapula.

To the External Ridge the Pectoralis Major is fixed, and to the Internal the Latissimus Dorsi and Teres Major are inserted.

Behind the lower end of this last, another *Ridge* for the Insertion of the Coraco-brachialis.

From the back part of the root of the largest Tubercle, a *Ridge* descends, from which the short Head of the Triceps Extensor Cubiti rises.

A *Passage* slanting downwards in the fore and inner part of the Bone, near its middle height, for the Medullary Vessels.

The outer side of the Bone, near its middle, somewhat *rough*, for the Insertion of the Deltoides.

The *Bone*, *marked* at the under end of the Groove for lodging the long Head of the Biceps, for the attachment of the Deltoides and other Muscles.

The Body of the Bone, *round* near its upper end; but, as it descends, appearing *twisted*, then *flat*, and increasing in breadth at the lower extremity.

From the Muscular Prints on the fore part of the Body of the Humerus, a *blunt Ridge* continued to the upper part of the Cartilaginous Surface covering the lower end of the Bone.

The under and back part of the Bone, rendered *flat* and *smooth*, by the motion of the Triceps Extensor Cubiti.

A *large Ridge* at the under and outer, and a *small Ridge* at the under and inner edge of the Bone, for the attachment of strong Tendinous Fasciæ, which give Origin to part of the Muscles of the Fore-arm.

The Ridges ending below in two Condyles, or Knuckle-like Processes, the situation of which, in order to avoid confusion in the terms *external*, *internal*, &

&c. is here to be considered with a reference to the Palm of the Hand turned forwards.

The *external Condyle*, placed at the under and outer part of the Bone, for the origin of the Extensor Muscles of the Hand and Fingers.

The *internal Condyle*, at the under and inner part of the Bone, more pointed and prominent than the former, for the Origin of the strong Flexor Muscles of the Hand and Fingers.

The *Surface* at the under end of the Bone, between the Condyles, covered with Cartilage for the articulation with the Bones of the Fore-arm.

The *oblique Situation* of the articulating Surface, the inner end being lower than the outer, by which the Hand turns more readily to the Face, or the upper parts of the Body.

The *inner Part* of the articulating Surface, consisting of a large internal and small external Eminence, with a middle Cavity, or a Trochlea, or Pulley, upon which the Ulna moves.

The *outer Part* of the Articular Surface, upon which the Head of the Radius plays, of a round form, and considered by some Authors as the smooth part of the outer Condyle.

Round the edge of the Articular Cavity, the Bone marked by the Insertion of the Capsular Ligament of the Joint.

A *small Cavity* at the under and fore part of the Bone, above the Trochlea, for receiving the Coronoid Process of the Ulna in the flexion of the Fore-arm.

A *large Cavity* at the under and back part of the

Bone, also above the Trochlea, the under part of it for receiving the Olecranon of the Ulna in the extension of the Fore-arm, and the upper part for containing the Fat of the Joint.

Between these Cavities the Bone is pressed so thin as often to become transparent, especially in an old person.

The *Substance* and *inner Structure* of the Os Humeri the same as in other long round Bones. The sides are compact, but the Cancelli are so large in the middle of the Bone, as to give the appearance of a hollow Cylinder.

The Ball of the Os Humeri is *articulated* with the Glenoid Cavity of the Scapula, which, from its superficial nature, and the long Ligaments inclosing the Joint, allows the Arm to move in all directions; the Bone even performing a small degree of motion round its own axis. The extent of motion of the Arm, however, is considerably increased by the rolling of the Scapula.

The Os Humeri gives Origin to the Brachialis Internus, second and third Heads of the Triceps Extensor Cubiti, Extensores Carpi Radiales Longior et Brevior, Supinator Radii Longus, Anconeus, Extensor Digitorum Communis, and Palmaris Longus;—to Part of the Supinator Radii Brevis, Extensor Carpi Ulnaris, Pronator Radii Teres, Flexor Carpi Radialis, Flexor Carpi Ulnaris, and Flexor Digitorum Sublimis.—Insertion to the Deltoides, Supra-spinatus, Infra-spinatus, Teretes Major et Minor, Subscapularis, Latissimus Dorsi, Pectoralis Major, and Coraco-brachialis.

In the Fœtus, the extremities of the Bone are Cartilaginous; and the Ball with the Tubercles, and the Trochlea with the Condyles, form afterwards Epiphyses, previous to their union with the Body of the Bone.

FORE-ARM.

Consisting of two Bones, the *Ulna* or Cubit, and *Radius* or Wheel-spoke-like Bone, both of which are observed to be proportionally longer in the African than in the European.

ULNA.

The *Situation* of the Ulna at the inner part of the Fore-arm; the Arm being supposed to hang by the side of the Body, with the Palm of the Hand turned forwards.

The *Olecranon*, *Processus Anconeus*, or *Top of the Cubit*, placed at the upper end of the Bone, and forming the posterior prominent part of the Elbow.

The upper end of this Process *rough*, where the Triceps Extensor Cubiti is fixed.

The *Coronoid* or *Sharp Process*, at the upper and fore part of the Bone, but considerably lower than the Olecranon, for forming a part of the Hinge of the Joint of the Elbow.

The *Great Sigmoid*, or *Semilunar Cavity*, between the Olecranon and Coronoid Process, lined with Cartilage, and divided into two slanting Surfaces by a middle Ridge, the Cavity being adapted to the Trochlea of the Os Humeri.

Across the middle of the great Sigmoid Cavity, a *little Pit*, for lodging part of the Fat of the Joint.

Round the edge of the Sigmoid Cavity, the Bone *rough*, for the attachment of the Capsular Ligament of the Joint.

The *Small Sigmoid*, or *Semilunar Cavity*, lined with Cartilage, at the outer side of the Coronoid Process, where the round Head of the Radius plays, which is confined in its place by an Annular Ligament, fixed to the Edges of this Cavity.

The *Tubercle* of the Ulna, or small rough spot under the root of the Coronoid Process, for the insertion of the Brachialis Internus.

At the upper and outer part of the Bone, a *triangular Surface*, where the Anconeus is lodged.

The *Body* of the Ulna, of a *triangular form*, becoming gradually smaller in its descent.

The *sharpest Angle* opposed to the Radius, for the attachment of the Interosseous Ligament.

The sides forming this Angle, *flat*, and *marked* by the Muscles which arise from them.

A *Passage* slanting upwards, about a hand-breadth below the upper end, for the Medullary Vessels.

The under end of the Bone, forming a *small round Head*, which is covered with Cartilage on that side where the Radius moves upon it, and also on its extremity, where it is opposed to a moveable Cartilage placed between it and the Carpus.

The *Styloid Process*, at the inner side of the small round Head, from which a strong Ligament goes off to be fixed to the Bones of the Wrist.

The Ulna is *articulated* at its superior extremity with the lower end of the Os Humeri, the Joint at this part forming a complete Hinge, which allows an extensive degree of flexion, and as much extension as to approach a straight line with the Upper Arm; but little or no rotation.

It gives Origin to the Pronator Radii Quadratus, and Indicator;—to Part of the Extensores Ossis Metacarpi, Primi Internodii et Secundi Internodii Pollicis, Flexores Carpi Radialis et Ulnaris, Flexores Digitorum Sublimis et Profundus, Supinator Radii Brevis, Pronator Radii Teres, Extensor Carpi Ulnaris.—Insertion to the Brachialis Internus, Triceps Extensor Cubiti, and Anconeus.

RADIUS.

The *Radius* shorter than the Ulna by the length of the Olecranon.

The *Situation* of the Radius at the outer part of the Fore-arm.

The *upper end of the Radius*, covered with Cartilage, and formed into a circular Head, which is hollowed above, for receiving the outer part of the Articular Surface of the Os Humeri.

The *inner Side of the Head* smooth, and also covered with Cartilage, where it plays in the small Semilunar Cavity at the outer side of the Ulna.

The *Cervix* of the Radius smaller than the Head; in the Subject surrounded by a circular Ligament, which keeps the Bone in its place, and allows it to roll upon the Ulna.

The *Tubercle* of the Radius, at the under and inner part of the Cervix, for the insertion of the Biceps Flexor Cubiti.

The *Body* of the Bone larger than that of the Ulna, convex on its outer and back part, and rounded here by the Muscles which cover it.

The *anterior* and *posterior Surfaces* next the Ulna *flat*, where Muscles of the Hand take their origin.

The *anterior* and *posterior Surfaces*, terminating next the Ulna, in a *sharp Ridge*, to which the Interosseous Ligament of the Fore-arm is fixed.

A *Passage* slanting upwards, on the fore part of the Bone, and about a hand-breadth below its upper end, for the Medullary Vessels.

A *rough Surface* at the outer and middle part of the Bone, for the insertion of the Pronator Radii Teres.

The *lower End of the Radius*, becoming gradually larger, and flat on its fore part, where it is covered by the Pronator Radii Quadratus.

A *Ridge* upon the under and back part of the Radius, with a Fossa upon each side of it, where the Tendons of the Extensor Muscles of the Fingers pass.

The outer side of this extremity of the Bone, *hollowed* by the Extensors of the Thumb.

A *semilunar Cavity* at the inner side of the under end of the Radius, lined with Cartilage, for receiving the corresponding extremity of the Ulna.

The *lower End* of the Bone, formed into a *Cavity* of an *oval* or *navicular* shape, and lined with Cartilage, for receiving the two first Bones of the Carpus.

A small Transverse Ridge, frequently found in the middle of this Cavity, which insinuates itself between the two first Bones of the Carpus.

The under and outer part of the Radius, forming a *Process* somewhat similar to the Styloid Process of the Ulna. From this a Ligament is sent to the Wrist.

The *Structure* of the Radius and Ulna is the same as that of other long Bones.

The Head of the Radius is *articulated* with the outer part of the articular Surface of the Os Humeri; the Radius is besides joined by a double articulation to the Ulna; for above, the Head of the Radius is received into the small Sigmoid Cavity of the Ulna, while the under end of the Ulna is received into the small Semilunar Cavity of the Radius; in consequence of which connection, the Radius accompanies the Ulna in the flexion and extension of the Fore-arm, while the Radius moves round its own axis above; but, at the lower end, it turns upon the round head of the Ulna, carrying the Hand with it.

The turning of the Radius with the Hand is termed *Supination* and *Pronation*; when the Palm is turned upwards, it is in a state of supination, and in pronation when in a contrary direction.

The Radius gives Origin to part of the Flexor Digitorum Sublimis, Flexor Longus, et Extensor Ossis Metacarpi Pollicis.—Insertion to the Biceps Flexor Cubiti, Supinatores Longus et Brevis, Pronatores, Teres, et Quadratus.

In the Fœtus, the extremities of the Bones of the Fore-arm are Cartilaginous; they afterwards become Epiphyses, before they are united to the Bodies of the Bones.

HAND.

The Hand, composed of the Bones of the *Carpus*, *Metacarpus*, and *Fingers*.

The *posterior Surface* of the Hand, *convex*, which gives it a greater degree of strength.

The *anterior Surface* of the Hand, *concave*, for grasping and holding Substances.

CARPUS, OR WRIST.

The *Carpus* is composed of *eight Bones*, disposed in two Rows; and each Bone being broader on its posterior than anterior Surface, they form an Arch convex behind, by which it gives security and strength; and concave before, for containing the Muscles, Vessels, and Nerves, which run to the Fingers.

The ends of the Arch on the Palm-side of the Wrist, form projecting Points, between which the Ligamentum Carpi Annulare is stretched, which confines the Muscles in their places.

The posterior or convex Surface of the Carpus, *marked* by the numerous Ligaments attached to it.

The anterior or hollow Surface, also marked by Ligaments.

The Bones of the Carpus are *articulated* with each other, or with the neighbouring Bones, and all their articular Surfaces are *covered with Cartilage*, to facilitate the motion of the Joints.

In the First Row of Carpal Bones are,

The *Ossa Scaphoides*, *Lunare*, *Cuneiforme*, *Pisiforme*.

In the Second Row,

The *Ossa Trapezium*, *Trapezoides*, *Magnum*, *Unciforme*.

The OS SCAPHOIDES, vel NAVICULARE, or Boat-like Bone, placed at the outer and upper part of the Carpus.

The *upper Surface*, *convex*, and articulated with the Radius.

The *under* and *outer Surface* also *convex*, to be articulated with the Trapezium and Trapezoides.

Between the upper and under Cartilaginous Surfaces, a *rough Fossa* for the insertion of the Capsular Ligament.

The anterior and inner Surface, having an *oval Cavity* which gives name to the Bone, where it is articulated with the Os Magnum.

A *Process* upon the outer end of the Bone, for the attachment of part of the anterior Transverse Ligament of the Wrist.

The Os Lunare, vel Semilunare, situated upon the inner side of the former Bone.

The *upper Surface, convex* for its articulation with the Radius.

The *outer Edge*, in form of a *Crescent*, from which the Bone is named, articulated with the Os Scaphoides.

The *under Surface, hollow* for its articulation with the Os Magnum.

The *inner Surface* of the Bone, articulated with the Os Cuneiforme.

The Os Cuneiforme, or Wedge-shaped Bone, or Os Triquetrum, less than, and *situated* on the inner side of the former Bone.

The *anterior Edge, thin*, in form of a *wedge.*

The *upper* and *outer Surface*, articulated with the Os Lunare.

The upper part forms a slight *Convexity*, which is included in the Joint of the Wrist. Here the moveable Cartilage already taken notice of, is interposed between this Bone and the Ulna.

The *under* and *outer Surface*, articulated with the Os Unciforme.

The *anterior* and *inner Surface*, forming a slight *convexity* for its articulation with the Os Pisiforme.

The three first Bones of the Carpus form an oval convexity, by which they are *articulated* with the lower end of the Bones of the Fore-arm; the Ossa Scaphoides and Lunare being received in the Socket formed by the Radius, while the Os Cuneiforme is opposed to the Cartilaginous end of the Ulna.

By this kind of *articulation*, extensive motion is allowed forwards and backwards, and to each side; and by a succession of these motions, the Hand is made to move in a circle; but no motion is performed by the Carpus round its own axis, except what it has along with the Radius in the Supination and Pronation of the Hand.

The Os PISIFORME, vel ORBICULARE, the least of the Carpal Bones, placed upon the anterior and inner Surface of the Os Cuneiforme, forming a Prominence which is readily felt in the Wrist, and which gives attachment to strong Tendons and Ligaments, particularly to part of the Ligamentum Carpi Annulare.

The Os Pisiforme gives Origin to part of the Abductor Minimi Digiti,—and Insertion to the Flexor Carpi Ulnaris, and to Part of the Palmaris Brevis.

The Os TRAPEZIUM, named from the four unequal Edges of its posterior Surface.

The *Situation* of this Bone, at the Root of the Metacarpal Bone of the Thumb.

The upper part of the Bone, forming a *smooth Pit*, to be articulated with the Os Scaphoides.

The inner side, *hollow*, and articulated with the Os Trapezoides.

The under Surface, forming a *Pulley*, on which the Metacarpal Bone of the Thumb moves.

The anterior Surface, sending out a *Process*, which is prominent in the Palm, and marked by the Transverse Ligament of the Wrist, by the Flexor Carpi Radialis, and Flexors of the Thumb.

The Os Trapezium gives Origin to part of the Opponens et Abductor Pollicis, Abductor Indicis,—and Insertion to the Extensor Ossis Metacarpi Pollicis.

The Os TRAPEZOIDES, so named from its being somewhat like the former Bone, though considerably smaller.

The *Situation* of the Os Trapezoides, at the inner side of the Os Trapezium.

The upper Surface, *hollow* where it joins the Os Scaphoides.

The outer Surface, *convex*, and articulated with the Trapezium.

The *inner Surface*, articulated with the Os Magnum.

The *under Surface*, formed into a sort of *Pulley*, to be articulated with the Metacarpal Bone of the Fore-finger.

The Os Trapezoides gives Origin to part of the Flexor Brevis Pollicis.

The Os MAGNUM, vel CAPITATUM, or *largest Bone* of the Carpus, placed at the inner side of the former Bone, and consisting of four oblong sides, with a round head, and triangular under end.

The *Head* or *Ball* of the Bone, received into the hollow Surfaces of the Subscapularis and Lunare, like ball and socket.

phoides.

The *under part* of the outer side, joined to the Os Trapezoides.

The *inner side*, to the Os Unciforme.

The *under end*, opposed to the Metacarpal Bone of the Middle Finger.

The Os Magnum gives Origin to part of the Flexor Brevis Pollicis.

The Os UNCIFORME, placed in the under and inner part of the Wrist.

The *upper* and *inner Surface*, articulated with the Os Cuneiforme.

The *outer Surface*, articulated with the Os Magnum.

The *inferior Surface*, opposed to the Metacarpal Bones of the Ring and Little Fingers.

The *anterior Surface*, sending out the *Unciform Process*, which gives name to the Bone.

The Unciform, or Hook-like Process, *curved* for the passage of the Flexor Muscles of the Fingers.

The Os Unciforme gives Origin to part of the Flexor Brevis Pollicis, Flexor Parvus Minimi Digiti, and Adductor Minimi Digiti.

The *Substance* of the Carpal Bones is spongy, but strong in proportion to their size.

The *Articulation* between the first and second Row of Carpal Bones allows motion to each side, but chiefly forwards and backwards; the motion, however, is less extensive than that between the Fore-arm and Wrist.

The Connection between the different Bones in each Row of the Carpus, is of such a nature as not to admit of any sensible motion.

The Carpus serves as a Base to the Hand, protects its Tendons, &c. and affords free and extensive motion.

In the Fœtus, the Bones of the Carpus are in a Cartilaginous state.

METACARPUS.

The *Metacarpus*, or Bones beyond the Wrist, consisting of *four Bones* for supporting the Fingers, and *one* for the Thumb.

Metacarpal Bones of the Fingers.

Their *Bodies* long and round behind, forming part of the convexity of the Hand; before, giving hollowness to the Palm.

The *extremities* of these Bones, considerably larger than their Bodies, in consequence of which they leave spaces for the Interossei.

The *upper Ends* or *Bases*, *flat*, where they are articulated with the Bones of the Carpus.

Round the edges of the Cartilaginous Surfaces, at the upper ends, the *Depressions* where the Capsular Ligaments are fixed.

The sides of the upper ends *flat*, and drawn close together, where they are articulated with each other.

Their Bodies *diverging* towards their under extremities, by which they regulate the motions of the Fingers.

A *Ridge* at the upper and back part of their Bodies, with a Depression on each side of it, formed by the Interossei.

The under and back part of their Bodies, made *flat* by the motion of the Tendons of the Extensors of the Fingers.

The anterior Surface of their Bodies *concave*, and rendered *flat at the sides*, by the Interossei.

The *lower Ends*, or *Heads*, formed into *Balls*, which are flattened at their sides by their motions upon each other.

At the fore part of each side of the Heads, a little *Prominence*, for the attachment of the Ligaments which fix these Bones to each other.

Round the Heads, a *Depression*, for the insertion of the Capsular Ligaments.

The Metacarpal Bones are joined by their Bases to the Carpus, and to each other by nearly plain Surfaces; in consequence of which, and the strength of their connecting Ligaments, their motions here are inconsiderable.

The Bones of the Metacarpus in general give Origin to the Interossei.

The *Metacarpal Bone of the Fore-finger*, commonly the longest of the Bones of the Metacarpus.

The *Base* of the Metacarpal Bone of the Fore-finger, opposed to, and corresponding with, the Os Trapezoides, and partly with the Os Trapezium.

The inner part of the Base, forming a *Ridge*, which is articulated with the Os Magnum, and with the next Metacarpal Bone.

The connection of the Base is so firm, that it has little or no motion.

The Metacarpal Bone of the Fore-finger gives Insertion to the Flexor Carpi Radialis, and Extensor Carpi Radialis Longior.

The *Metacarpal Bone of the Mid-finger*, commonly the *second in length.*

The *Base* of the Bone generally slanting inwards and downwards, opposed to the Os Magnum.

The outer and back part of the Base *projecting*, and forming a sort of *Process*, the external Surface of which is connected with the Ridge of the former Bone.

The motion of this Bone little more than that of the former one.

It gives Origin to the Adductor Pollicis,—and Insertion to the Extensor Carpi Radialis Brevior.

The *Metacarpal Bone of the Ring-finger*, *shorter* than the former Bone.

Its Base, *semicircular* where it is opposed to the Os Unciforme.

The motion is something greater than that of the former Bone.

The *Metacarpal Bone of the Little Finger*, the *smallest* of the four.

The Base, which slants downwards and outwards, opposed to the under and inner part of the Os Unciforme.

The inner part of the Base destitute of a smooth surface, not being contiguous to any other Bone.

From the nature of the Joint, the looseness of the Ligaments, and from the existence of a proper Muscle here, this Bone possesses a larger share of motion than any of the rest.

It has inserted into it the Extensor Carpi Ulnaris, and Adductor Minimi Digiti.

Metacarpal Bone of the Thumb.

The *Metacarpal Bone of the Thumb,* having the general resemblance of those of the Fingers, but differing from them in being placed obliquely with respect to them, and in some measure opposing them.

This Bone thicker and stronger, but shorter than any of those of the Fingers.

The *Base* of this Bone articulated with the Pulley formed by the Trapezium, the Bone appearing to admit of flexion and extension only; but, from the looseness of the Ligaments, possessing the same kind of motion with Joints formed after the manner of Ball and Socket.

The *inferior extremity* of the Bone, considerably *flatter* than those of the other Metacarpal Bones.

This Bone gives Origin to part of the Abductor Indicis;—Insertion to the Opponens Pollicis,—and to Part of the Extensor Ossis Metacarpi Pollicis.

Bones of the Fingers.

The *Fingers, composed* each of three Bones; the three Rows of Bones, taken transversely, termed *Phalanges.*

The different Phalanges, *tapering* a little as they descend, and their Bases larger than their inferior extremities.

The posterior Surfaces *convex,* and covered chiefly by the Tendinous Expansions of the Extensors of the Fingers.

Their anterior Surfaces *flat*, and in some parts *concave*, for lodging the Tendons of the Flexor Muscles.

Ridges at the sides of their anterior Surfaces, for the attachment of the retaining Ligaments of the Tendons of the Flexor Muscles.

The Phalanges, in general, have inserted into them the Extensor Digitorum Communis.

The first or Metacarpal Phalanx, *longer* than the second or middle, and the second than the third.

The *Bases* or upper ends of the first Phalanx formed into *Sockets*, to receive the Balls of the Metacarpal Bones, and to allow motion to all sides.

The lower ends of this Phalanx, consisting of *lateral Prominences*, and *middle Cavities* or Pulleys, the Cartilaginous Surfaces of which reach considerably farther up in the fore than in the back part.

The first Phalanx, by means of the Extensor Digitorum Communis, gives Insertion to the Lumbricales and Interossei.

The *Bases* of the second Phalanx, with *lateral Cavities* and *middle Ridges*, corresponding with the Pulleys of the first Phalanx, and admitting of flexion and extension only.

The *lower ends* of this Phalanx, similar to those of the first.

To this Phalanx the Flexor Digitorum Sublimis is fixed.

The *Bases* of the *third Phalanx*, or Phalanx Unguium,

guium, or Nail Phalanx, like those of the second, and the motions also similar.

The under ends of the third Phalanx *rough*, where the Pulpy, Vascular, and Nervous Substance of the points of the Fingers is situated.

To this Phalanx the Flexor Digitorum Profundus is inserted.

The peculiarities of the Bones of the Fingers consist only in their size.

The Bones of the Mid-finger the largest and longest.

Those of the Ring-finger next in length.

The Bones of the Fore-finger next to those of the Ring-finger in length, and of the Mid-finger in thickness.

They have inserted into them the Indicator, and Abductor Indicis.

Those of the fourth Finger the smallest.

They have fixed to them the Flexor Parvus, and Abductor Minimi Digiti.

Bones of the Thumb.

The *Thumb*, consisting of only *two* Bones.

The *first* Bone like the Bones of the first Phalanx of the Fingers, but *thicker* and *stronger*.

The *Cavity* at the Base of the Bone, longer from one side to the other, and shallower than the Cavities of the corresponding Bones of the Fingers, but like them, forming a Socket for the Metacarpal Bone. From the flatness of the Joint, however, and strength of the lateral Ligaments, the motions here are confined to flexion and extension only.

The *lower end* of the first Bone of the Thumb like that of the first of the Fingers.

It gives Insertion to the Extensor Primi Internodii, Abductor, et Adductor Pollicis,—and to Part of the Flexor Brevis Pollicis.

The *second Bone* of the Thumb like the *third* of the Fingers, but broader.

The *Base* of this Bone, like that of the second and third Bones of the Fingers, and like their Joints also, admitting of flexion and extension only.

It has inserted into it the Flexor Longus, et Extensor Secundi Internodii Pollicis.

The *Substance* of the Bones of the Metacarpus, and of those of the Fingers and Thumb, is the same with that of the Long Bones.

In the Fœtus, both extremities of the Metacarpal Bones of the first and second Phalanx, and upper ends of the third, are in a state of Cartilage.

INFERIOR EXTREMITIES.

OBSERVE here,

Each of the *Inferior Extremities*, composed of the Thigh, Leg, and Foot.

THIGH.

The *Thigh*, consisting of a single Bone, viz.

OS FEMORIS.

The Os Femoris, or Thigh-bone, the *largest* and *longest* Bone of the Body, and *thickest* and *strongest* of the Cylindrical Bones.

The *Situation* of the Bone, at the under and outer part of the Pelvis.

The *oblique* situation of the *Body* of the Bone; the under end being considerably nearer its fellow than the upper one is, which is favourable for the passages at the bottom of the Pelvis, for the origin of Muscles, and for walking.

The *Ball* or *Head* of the Thigh-bone, smooth, covered with Cartilage, and forming almost two-thirds of a

Sphere, which is received into the deep Socket formed by the Acetabulum of the Os Innominatum.

The *Edge* of the Cartilaginous Surface, having an undulated appearance, corresponding with that of the Brim of the Acetabulum.

A *rough Pit* at the inner part of the Ball, a little below its middle, and destitute of Cartilage, for the attachment of the Ligamentum Rotundum, which is fixed by its other end to the bottom of the Acetabulum.

The *Cervix* or *Neck*, much longer than that of any other Bone, passing obliquely downwards and outwards from the Ball, to allow the free motion of the Body of the Bone in different directions.

Numerous Holes in the Cervix, for the Insertion of the Fibres of the Ligament reflected from the Capsular one.

The *Trochanter Major*, placed at the outer part of the Neck, and upper end of the Body of the Bone, for the Insertion of the Extensor, Abductor, and Rotator Muscles of the Thigh; these, performing the office of rolling or running, give rise to the name *Trochanter*.

Two rough Surfaces upon the upper and fore part of the large Trochanter, for the Insertion of the Glutei Medius et Minimus.

A *Cavity*, termed *Fossa Trochanteria*, placed at the inner side of the Root of the large Trochanter, for the Insertion of the Rotator Muscles of the Thigh.

The *Trochanter Minor*, at the under and inner part of the Cervix, for the Insertion of the Flexor Muscles of the Thigh.

The Trochanter Minor is small and pointed, and, in the Subject, is so much covered by Muscles, as to be out of the reach of the Finger.

A *rough Line* on the fore part of the Bone, extending obliquely between the two Trochanters, for the Insertion of the Capsular Ligament.

A *rough Line* between the Trochanters, on the *back part* of the Bone, for the Insertion of the Capsular Ligament, and of the Quadratus Femoris.

The *Body* of the Thigh-bone *bent forwards*, and a *little outwards*, of a *roundish form* above, but somewhat *triangular* about its middle.

The *fore part* of the Bone, *flat*, where it is covered by the Crureus.

The *Sides* of the Bone *flattened* at its middle and lower part by the two Vasti.

The *Linea Aspera*, or *Ragged Ridge*, on the back part of the Bone, extending from the Trochanters, but chiefly from the large one, to the lower part of the Bone, and giving attachment to numerous Muscles which pass from the Pelvis to the Thigh, or from the Thigh to the Leg.

The Linea Aspera is forked at both its extremities; extending above to the Trochanters, while below the two lines into which it divides terminate in the Condyles.

The *Canal* for the Medullary Vessels, slanting upwards, a little below the middle height of the posterior part of the Bone.

The *under* and *back part* of the Bone *flat*, where the Popliteal Vessels and Nerves are placed.

The *lower End* of the Bone becoming gradually larger, and perforated by many Holes, for the insertion of the Capsular Ligament of the Knee, and for the passage of the Nutritious Vessels of the Bone.

The lower End, also marked by the insertion of several Muscles.

The *Cartilaginous Trochlea* at the under and fore part of the Bone, placed obliquely, with its outer Surface larger and higher than its inner one, to be adapted to the Patella, which moves upon it.

The *external* and *internal Condyles*, continued back from the Trochlea, and also covered with Cartilage, for the motion of the Tibia.

The *internal Condyle*, *larger* and *deeper* than the external, to compensate for the obliquity of the Thigh, and to give less obliquity to the Leg.

A *Notch* between the back part of the Condyles, for lodging the Popliteal Vessels and Nerves.

A *semilunar rough Notch*, deeper and lower than the former one, for the attachment of the Crucial or internal Ligaments of the Knee.

The *inner Substance* of this Bone, like that of other long Bones, consisting of a fibrous reticular texture in the middle, and lamellated Cancelli at the extremities. The Body of the Bone has remarkably thick and strong solid sides; but these, towards the ends, become almost as thin as a piece of paper.

The Thigh-bone is articulated above with the Os Innominatum, which allows the free motion of the Body of the Bone in all directions. It is restrained, however, in its motions outwards by the Ligamentum Rotundum, and by the high brim of the Acetabulum.

The Head and Neck of the Bone can move round their own axis, though its Body possesses little rotatory motion. In consequence of the oblique situation of the Head and Neck, when the Ball rolls, the Body of the Bone is only brought forwards or backwards.

The Thigh-bone gives Origin to the Vasti Externus et Internus, Crureus, short Head of the Biceps Flexor Cruris, Gastrocnemius Externus, Plantaris, and Popliteus.—Insertion to the Iliacus Internus and Psoas Magnus, Glutei Maximus, Medius, et Minimus, Pyriformis, Gemini, Obturatores Externus et Internus, Quadratus Femoris, Pectinalis, and Triceps Adductor Femoris.

In the Fœtus, the Body of the Bone is ossified, the different Processes are Cartilaginous, and afterwards form large Epiphyses.

LEG,

Composed of two Bones, the Tibia and Fibula,—to which may be added the Patella.

TIBIA.

The Tibia, or Bone compared to an ancient musical Pipe, situated at the inner part of the Leg, and by much the largest of the two Bones.

The *upper End* of the Tibia, forming a *large Head*, and that divided above into *two superficial Cavities*, for receiving the Cartilaginous part of the Condyles of the Thigh-bone.

A *rough Protuberance* projecting between the articulating Cavities, and received in the space between the Condyles. It is *pitted* on its fore and back parts, for the insertion of the anterior and posterior Crucial Ligaments.

The articulating Surfaces at the upper end of the Tibia, are rendered *deeper* in the Subject by the addition of two Semilunar Cartilages placed upon their edges.

The circumference of the Head of the Bone, *rough* and *porous*, for the insertion of the Capsular Ligament.

A *Tubercle* at the upper and fore part of the Bone, for the insertion of the lower Tendon or Ligament of the Patella.

A *Cartilaginous Surface* under the outer Edge of the Head of the Bone, for the articulation with the upper end of the Fibula.

The *Body* of the Bone, of a *triangular form*, with the sharpest Angle placed anteriorly.

The *anterior Angle*, called *Spine* or *Shin*, a little waved, and extending from the Tubercle to the inner Ankle.

The *anterior* and *inner Surface* of the Bone, *smooth*, being covered with Skin only.

The *Internal Angle*, for the attachment of part of the Aponeurosis of the Leg.

The *anterior* and *outer Surface*, *hollowed* by the Tibialis Anticus, viz. one of the Flexor Muscles of the Foot, and by the long Extensors of the Toes.

The *External Angle*, or that at the *outer* and *back part* of the Bone, giving attachment to the Interosseous Ligament.

The middle of the posterior Surface, also *hollowed* by Muscles which assist in extending the Foot, and in bending the Toes.

A *Ridge* extending obliquely downwards from the upper and outer part of the Bone, posteriorly, to its inner Angle, and giving origin to part of the Muscles which extend the Foot and bend the Toes.

A *flat Surface* above the Ridge, and under the Head of the Tibia, indicating the situation of the Popliteus.

The *Canal* for the Medullary Vessels, slanting downwards at the inner and back part of the Bone, a little above its middle height.

The *under end* of the Tibia *smaller* than the upper one, and its inferior Surface *hollow*, and covered with Cartilage, for the articulation with the Astragalus.

The *Malleolus Internus*, or Mallet-like Process, or *inner Ankle*, produced from the inner and fore part of the under end, and covered also with Cartilage where the Astragalus plays.

A *Pit* in the point of the Malleolus Internus, for the attachment of the internal Lateral Ligament, and a *Groove* behind, where the Tendon of the Tibialis Posticus is placed.

The *semicircular Cavity*, at the under and outer side of the Tibia, for receiving the under end of the Fibula.

Round the edge of the articulating Cavity, the Bone, *marked* by the insertion of the Capsular Ligament.

The Tibia has a strong external Table, with a considerable quantity of spongy Substance.

The *Articulation* of the upper end of the Tibia with the Os Femoris, is of such a nature as to allow flexion to a great degree, but the numerous Ligaments fixed here prevent it from being extended beyond a straight line with the Thigh; and then there is no rotation nor lateral motion, though, when the Joint is bent, the Ligaments are so much relaxed, that the Leg may be made in a small degree to roll, or to turn a little to either side.

The Tibia gives Origin to the Tibialis Anticus, and Flexor Longus Digitorum,—to Part of the Extensor Longus Digitorum, Soleus, and Tibialis Posticus.

Insertion to the Sartorius, Gracilis, Semi-tendinosus, Semi-membranosus, Popliteus, and through the medium of the Patella, to the Extensors of the Leg.

The Extremities of the Tibia are Cartilaginous in the Fœtus, and become afterwards Epiphyses.

FIBULA, vel OS PERONE.

The Fibula, placed at the outer side of the Tibia, where the Fibula, or Clasp, was formerly used, by much the smaller of the two Bones, being the most slender Bone, in proportion to its length, of any in the Body.

The upper end of the Fibula, formed into a *large Head*, with a *Superficial smooth Cavity* towards its inner side, to be articulated with the Tibia, where it is tied by Ligaments of such strength as to allow very little motion.

The *Head* of the Fibula, *irregular* and *rough* externally, for the insertion of the Biceps Flexor Cruris, and of the external Lateral Ligament of the Knee.

The *Body* of the Bone bent a little inwards and backwards, and unequally triangular above, but somewhat quadrangular below, with the surfaces between the Angles marked by the Muscles which arise from it, or are placed upon it.

A *Ridge* at the inner side of the Fibula, opposed to one at the outer part of the Tibia, for the insertion of the Interosseous Ligament.

A *Canal* on the back part of the Bone, slanting obliquely downwards, a little above its middle, for the passage of the Medullary Vessels.

The *under End* of the Fibula, *broad* and *flat*, to be received by the Semilunar Cavity of the Tibia.

The under end of the Bone forming the *Malleolus Externus*, or outer Ankle, which is larger, longer, lower and farther back than the inner Ankle, the obliquity of the two Malleoli in some measure corresponding with the obliquity of the Foot.

A *convex smooth Surface* on the inner side of the Malleolus Externus, opposed to the outer side of the Astragalus, which moves upon it.

The *Coronoid Process*, sent down from the Malleolus Externus, from which Ligaments go to the Bones at the outer side of the Foot.

A *Furrow* upon the back part of the Malleolus Externus, for lodging part of the Tendons of the Peronei.

The

The *Substance* of the Tibia and Fibula is like that in other long Bones.

The Fibula being articulated with the Tibia at its superior extremity by almost plain surfaces, and tied to it by strong and short Ligaments, only a very little motion is allowed.

At the under end it is joined so firmly by strong Ligaments, that no sensible motion appears in the Subject; though in this joint, as in several others, where the Bones are firmly fixed by short Ligaments, there may be an elastic yielding in the living Body.

In old people, these two Bones are not unfrequently joined at their under extremities by an union of Substance.

The Fibula affords attachment to Muscles; assists in securing the articulation of the Foot; adds to the form and strength of the Leg; and, by the head of the Bone being fixed to that of the Tibia, it widens the space for the Interosseous Ligament.

The Fibula gives origin to the Peronei Longus, Brevis, et Tertius, Extensor Proprius Pollicis, Flexor Longus Pollicis,—to Part of the Extensor Longus Digitorum, Soleus, Peroneus Longus, Tibialis Posticus, —Insertion to the Biceps Flexor Cruris.

In the Fœtus, the extremities of the Fibula are Cartilaginous, and afterwards become Epiphyses, previous to being united to the Body of the Bone.

PATELLA, vel ROTULA, or KNEE-PAN.

The Patella, *placed* at the fore part of the Joint of the Knee, and in some respects bearing the same relation to the Tibia as the Olecranon does to the Ulna.

The *shape* of the Patella, *triangular* and *flat*, or of the figure of a Heart as painted upon playing-cards, and having its point downwards.

The *anterior Surface* of the Bone, *convex*, and perforated by numerous Holes, for the insertion of Tendons and Ligaments which cover it.

The *posterior Surface*, which corresponds with the Trochlea of the Os Femoris, *smooth*, covered with Cartilage, and divided by a longitudinal prominent Ridge into two unequal-sized Cavities, of which the External is the largest, like the Trochlea, to which it is adapted.

The circumference of the articular Surface, *marked* by a *rough Line*, into which the Capsular Ligament of the Joint is fixed.

The Base, or upper part of the Bone, *horizontal*, and *marked* by the insertion of the Tendons of the Extensors of the Leg.

The back part of the Apex *rough* and *depressed*, for the attachment of the Ligament which passes from the Patella to the Tubercle of the Tibia.

The Patella has a thin, though firm external Table. Its internal Substance is Cellular, but the Cells are small, and have so much Osseous Matter employed in their formation, as to give the Bone a considerable degree of strength.

The structure of this Bone, the toughness of the Ligaments which cover it, and the free motion it is allowed, are found to enable it better to resist any common force applied to it, than if it had been a process continued from the Tibia, as the Olecranon is from the Ulna.

The Ligaments of the Patella allow it to be moved upwards and downwards; and when the Leg is extended, they admit of its motion to either side, or to be rolled.

When the Leg is extended, the Patella is lodged in the Trochlea of the Os Femoris; when the Limb is bent, the Patella is pulled down by the Tibia, and lodged in a hollow at the fore part of the Knee.

The Patella defends the fore part of the Knee, increases the Angle of insertion of the Muscles fixed to it, and serves as a pulley or lever, by enabling the Muscles to act with greater advantage in extending the Leg.

It gives attachment to the Rectus, Cruralis, Vasti Externus et Internus.

It is entirely Cartilaginous at Birth, and is later in ossifying than most of the Epiphyses; the points of Ossification commonly not appearing till after the fifth or sixth year.

FOOT.

The *Foot*, composed of *Tarsus*, *Metatarsus*, and *Toes*.

TARSUS.

The *Tarsus*, or Instep, composed of seven Bones, viz. The *Astragalus*, *Ossa Calcis*, *Naviculare*, *Cuneiforme Internum*, *Cuneiforme Medium*, *Cuneiforme Externum*, et *Cuboides*.

The upper part of the Tarsus *convex*, the under part *concave*.

In the *Concavity*, numerous *Muscles*, *Vessels*, and *Nerves* are lodged, belonging to the Sole.

The different Bones of the Tarsus have their *rough Surfaces joined together by strong Ligaments*, and their parts of articulation *covered with Cartilage*, in such a manner as to form part of a strong and elastic Arch, for supporting the weight of the Body, and lessening the shock it would otherwise undergo in its different motions.

The ASTRAGALUS, or Bone compared in shape to that of an Ancient Die, placed directly under the Tibia.

The upper part of the Astragalus, formed into a *large Head*, resembling a Pulley, which is smooth on its upper part and sides, to be articulated with the under end of the Leg-bones.

Each of the Cartilaginous Surfaces of the Head of this Bone *depressed* in its middle, to correspond with the parts of the Leg-bones with which it is articulated.

Round the inferior edge of the articulating Surfaces, a *rough Fossa* for the insertion of the Capsular Ligament; and at the sides of this Surface, the Bone marked by the lateral Ligaments.

The under part of the Bone, consisting of a *deep Fossa*, or sinuous Cavity, which divides it into an anterior and posterior articulating Surface.

The Fossa in the under Surface, narrower at the inner part of the Bone, and becoming gradually wider as it goes outwards and forwards.

The *posterior articulating Surface*, *large* and *concave* for its articulation with the upper and middle part of the Os Calcis.

The *anterior articulating Surface*, *irregular*, and *convex*, where it plays upon two smooth Cavities at the inner and fore part of the Os Calcis, and upon a Cartilaginous Ligament extended between the Os Calcis and Os Naviculare.

A *large oblong smooth Head*, at the fore part of the Bone, for its articulation with the Os Naviculare.

The *Joint* between the Astragalus and Leg-bones forms a *complete Hinge*, which, together with the above-mentioned Ligaments, allows the Foot to bend and extend upon the Leg, but admits of no lateral nor rotatory motion, except in the extended state, when there is a little of each.

In the Fœtus, a considerable portion of this Bone is ossified.

The OS CALCIS, vel CALCANEUS, or Heel-bone, the largest of the Tarsal Bones, situated under the Astragalus, and in the back part of the Foot.

A *large rough Tuberosity* or *Knob*, projecting behind, to form the Heel, and to make one end of the Arch of the Foot.

A *Superficial Cavity* in the upper and back part of this Knob, for the insertion of the *Tendo* ACHILLIS.

A *smooth Convexity* on the upper part of the Bone, for its articulation with the under and back part of the Astragalus.

A *Fossa* or Sinuous Cavity at the fore part of this articulating Surface, running forwards and outwards, and giving origin to strong Ligaments which are inserted into the corresponding Fossa of the Astragalus.

Two Prominences at the inner and fore part of the Bone, concave, and smooth above, with a Pit between them, for the articulation with the under and fore part of the Astragalus.

From the posterior Prominence, the Cartilaginous Ligament arises, which is fixed to the Os Naviculare.

A *large Cavity* or Arch at the inner side of the Bone, between the posterior of the two last-mentioned Processes and projection of the Heel, for lodging the Tendons of the long Flexors of the Toes, together with the Vessels and Nerves of the Sole.

A *Depression* in the external Surface of the Bone, near its fore part, where the Tendon of the Peroneus Longus runs, in its way to the Sole.

The under and back part of the bone, forming *two Prominences*, where it gives origin to the Aponeurosis, and to several Muscles of the Sole; and before the Prominences, the Bone *concave*, where it lodges part of these Muscles.

The anterior Surface *concave*, and somewhat in form of a pulley placed obliquely, for its articulation with the Os Cuboides.

The *Os Calcis* is articulated with the Astragalus by Ligaments of such strength, that this part of the Foot, upon which the Body rests, is rendered firm and secure, but enjoys very little motion.

It gives Origin to the Extensor Brevis Digitorum, Flexor Brevis Digitorum, Flexor Accessorius, Abductor Pollicis,—to Part of the Adductor Pollicis, Flexor Brevis Pollicis, Abductor Minimi Digiti;—Insertion to the Gastrocnemii Externus et Internus, and Plantaris.

In the Fœtus, a large proportion of this Bone is ossified, and the Projection forming the Heel is for some time afterwards an Epiphysis.

The Os Naviculare, or Boat-like Bone, situated at the fore part of the Astragalus, and inner part of the Foot.

The *posterior Surface*, forming a *Cavity* somewhat like that of a Boat, for receiving the Head of the Astragalus in the manner of Ball and Socket.

A *Prominence* at the inner side of the Bone, for the insertion of Tendons, Muscles, and strong Ligaments, particularly for the Ligament stretched between this Bone and the Os Calcis, for the support of the Astragalus.

The *fore part* of the Bone *convex*, and divided into *three articular Surfaces*, for the articulation with the Ossa Cuneiformia.

Between the Os Naviculare and Astragalus, the Foot has its principal lateral and rotatory motions, though each of the other Joints of the Tarsus contributes a little.

The Os Naviculare gives Insertion to part of the Tibialis Posticus.

The Three OSSA CUNEIFORMIA, or Wedge-shaped Bones, situated at the fore part of the Tarsus, and inner side of the Os Cuboides, and applied to each other like the stones of an Arch.

The *upper part* of these Bones, *flat* where they are covered with Ligaments.

The *under part irregular*, for the attachment of Muscles and strong Ligaments lying in the Sole.

The *posterior Surface*, *flat*, and covered with Cartilage, to be articulated with the Os Naviculare.

The *anterior Surface*, also flat, for the articulation with the Metatarsal Bones.

The *Os Cuneiforme Internum*, vel *Maximum*, vel *Primum*, the largest of the Cuneiform Bones, and placed obliquely, with its anterior Surface opposed to the Metatarsal Bone of the Great Toe.

The sharp Edge of this Bone turned upwards, while that of the other two is in the opposite direction.

It gives Origin to the short Head of the Abductor Pollicis,—Insertion to Part of the Tibialis Anticus et Posticus, and Peroneus Longus.

The *Os Cuneiforme Medium*, vel *Minimum*, vel *Secundum*, the least of the three, and articulated at its inner side with the former Bone, and anteriorly with the second Metatarsal Bone.

The *Os Cuneiforme Externum*, vel *Tertium*, sometimes called *Medium*, as being of a middle size between the former two Bones, opposed to the Metatarsal Bone of the Third Toe.—The inner side of this Bone articulated with the former Bone.

This Bone gives Origin to part of the Flexor Brevis and Adductor Pollicis.

The Os CUBOIDES, or Cube-like Bone, placed at the fore and outer part of the Tarsus.

The *posterior Surface* of this Bone *smooth*, *convex* at its *inner*, and *concave* at its *outer* part, corresponding with the anterior extremity of the Os Calcis.

The *inner side*, articulated with the Os Naviculare and external Os Cuneiforme.

Its *under Surface*, *irregular* where it gives attachment to strong Ligaments, and to the Adductor Pollicis.

A *deep Fossa* in the outer and under part of the Bone, for lodging the Tendon of the Peroneus Longus, where it crosses the Sole.

The *anterior* Extremity, divided into a small inner, and large outer plain surface, to be articulated with the fourth and fifth Metatarsal Bones.

The Os Cuboides gives Origin to part of the Flexor Brevis Minimi Digiti,—and Insertion to part of the Tibialis Posticus and Adductor Pollicis.

The *Os Naviculare*, *Ossa Cuneiformia*, and *Os Cuboides*, are almost Cartilaginous at Birth.

METATARSUS.

The *Metatarsus*, or Bones beyond the Tarsus, composed of *five Bones*, which answer to the general characters given to the Metacarpal Bones.

Their *Bodies long*, *arched upwards*, and *tapering* towards their anterior extremities.

The *extremities*, *large* in proportion to their Bodies, and the posterior much larger than the anterior.

The *Bases*, or Posterior Extremities, *flat*, or a very little *hollowed*, to be articulated with the fore part of the Tarsal Bones.

From the flatness of their Bases, and the strength of the Ligaments which fix these Bones to those of the Tarsus, very little motion is allowed to this part of the Foot.

Round the Bases, *rough Surfaces* for the attachment of Ligaments.

The *sides of the Bases*, *flat* where they are articulated with each other.

A *Ridge* above, and a *flat Surface* at each side of their bodies, for the Origin of the Interossei.

The *flat Surfaces* turned obliquely outwards, and the obliquity increasing the more externally the Bones are placed.

The *anterior Extremities* forming *Balls*, to be articulated with the Toes;—the Balls much longer from above downwards, than from one side to the other.

Round the Heads *distinct Impressions*, where the Capsular Ligaments are fixed.

The Metatarsal Bones in general give Origin to the Interossei.

The *Metatarsal Bone of the Great Toe*, by much the thickest and strongest, but shortest of the Metatarsus.

The *articulating Cavity* of its Base, deeper than the rest.

The *anterior Extremity*, bearing a greater proportion to the *Base* than the rest, having a much larger share of the weight of the Body to sustain here, and formed into a *middle Prominence*, with *two lateral Depressions*, where the Bones termed *Ossa Sesamoidea* move.

It gives Origin to part of the Transversalis Pedis.—Insertion to part of the Tibialis Anticus, Peroneus Longus, and Adductor Pollicis.

The *Metatarsal Bone of the first of the Small Toes*, the longest of the five.

The *Metatarsal Bone of the Middle Toe*, the second in length, with a Base like that of the former Bone, triangular, but a little larger, to be articulated with the Os Cuneiforme Externum.

The *Metatarsal Bone of the third of the Small Toes*, nearly of the same length as the former, but distinguished from it by its Base being thicker below, and its Cartilaginous Surface being more of a square form, corresponding with the anterior and inner part of the Os Cuboides, with which it is articulated.

The *Metatarsal Bone of the Little Toe*, the shortest of those of the Small Toes, with flat Surfaces facing upwards and downwards.

It gives Insertion to the Peronei Brevis et Tertius, Transversalis Pedis, and to Part of the Flexor Brevis Minimi Digiti.

The *Base* which rests on the Os Cuboides, projecting outwardly into a large Tuberosity, which gives Origin to Muscles, and forms one of the points on which the Body rests in standing.

The Bones of the Metatarsus, with those of the Tarsus, form an irregular Arch for supporting the Body, one end of the Arch being formed by the projection of the Heel, the other by the anterior extremity of the Metatarsal Bones. The different pieces composing this Arch are bound by Ligaments of such strength, as to give security to the whole.

TOES.

The *Bones of the Toes*, the same in number with those of the Fingers, viz. two to the Great Toe, and three to each of the smaller Toes; and the different Bones here, as in the Fingers, disposed in Ranks or Phalanges.

The *two Bones of the Great Toe* like those of the Thumb, but stronger, and placed in the same row with the Bones of the smaller Toes, for the purpose of walking, and assisting in supporting the Body.

The first Bone of the Great Toe gives Insertion to part of the Extensor Brevis Digitorum, Extensor Proprius, Flexor Brevis, Abductor et Adductor Pollicis.

The second Bone of the Great Toe gives Insertion to the Flexor Longus Pollicis,—and to Part of the Extensor Proprius Pollicis.

The *Bones of the Smaller Toes*, every way less than those of the Fingers.

Their *under Surface depressed*, where the Tendons of their Flexor Muscles are lodged.

The *Bases* of the first Phalanx, as in the Fingers, forming Sockets to receive the Balls or Heads of the Metatarsal Bones.

The *Joints* between the first and second Phalanx, and also between the second and third, as in the Fingers, forming *Hinges*, and the motion similar, but more confined.

Of the Bones of the small Toes, the *first*, or that next the Great Toe, the *largest*, the rest becoming *smaller* the more externally they are placed.

The *structure* of the Bones of the Foot is nearly similar to that of the Bones of the Hand.

The Phalanges of the small Toes, in general, give Insertion to the Extensor Longus, and also to the Extensor Brevis, with the exception of the Little Toe. The first Phalanx has inserted into it the Lumbricales and Interossei, the second Phalanx the Flexor Brevis, and the third Phalanx the Flexor Longus.

To the Little Toe are inserted, besides the Tendons of the general Flexors and Extensors, the Abductor et Flexor Brevis Minimi Digiti.

The Bones of the Toes allow a free and easy motion in Children, and a considerable degree of it also in people whose feet have not been confined in shoes. In others, especially in advanced life, the Toes are frequently found squeezed together, and some of the smallest Bones of the Toes, as the two last of the little one, have the pieces which originally composed them, joined together by an union of Substance.

In the Fœtus, the Bones of the Metatarsus and Toes are in the same condition as those of the Metacarpus and Fingers.

OSSA SESAMOIDEA,

Or Bones resembling the Seeds of the Sesamum or Oily-grain.

Their size, situation, and number, vary in different persons.

They are sometimes found single at the roots of the Fingers and Small Toes, at the second Joint of the Thumb, and at the corresponding one of the Great Toe; between the Condyles of the Os Femoris and Gastrocnemius Muscle; between the Tendons of the Peroneus Longus and Os Cuboides, &c.

Those always present are placed in pairs at the roots of the Thumb and Great Toe, between the Tendons of their Flexor Muscles and Joints.

They are *convex* on their outer Surface, where they are inclosed by the Tendons and Muscles fixed to them.

And *concave*, and lined with Cartilage next the Joints, where they play upon the Bones with which they are articulated.

They are considered by Anatomists as serving the same general purpose with the Patella, which is looked upon by some Authors as the largest of these.

They give Insertion to the Flexor Brevis Pollicis Manus, and to the Flexor Brevis, Abductor et Adductor Pollicis Pedis.

PRINCIPAL DIFFERENCES

BETWEEN

THE MALE AND FEMALE SKELETON.

The Female Skeleton is observed, in general, to be smaller and more slender throughout than that of the Male.

The Bone of an Adult Female, of the same size with that of a Male, is usually distinguished by the Ridges, Depressions, rough Surfaces, and other Inequalities, being less conspicuous in the former.

The Circumference of the Female Skull is said by Soemmerring to be larger.

The Os Frontis is found to be more frequently divided by a continuation of the Sagittal Suture.

The Frontal Sinuses are observed to be narrower;

All the Bones of the Face more delicate;

The Bodies of the Vertebræ longer, and the Vertebral Canal, according to the Author quoted above, larger;

The Intervertebral Substances deeper or thicker;

The Cartilages of the True Ribs longer in proportion to the Osseous part, and broader and flatter to support the Breasts;

The Sternum more raised, and the whole Thorax shorter, deeper from before backwards, and more distant from the Pelvis;

The length of the Sternum less, and terminating below on a line nearly opposite to the Plane of the Fourth Pair of Ribs, but in the Male Skeleton terminating opposite to that of the Fifth Pair;

The Cartilago Ensiformis oftener perforated in the middle, or bifurcated;

The length of the Loins greater;

The Pelvis wider in all its dimensions;

The Spines and Processes of the Ossa Innominata farther distant from each other;

The Os Sacrum broader, and turned more backwards, to enlarge the Cavity of the Pelvis;

The Os Coccygis more slender, turned more backwards, and having a greater degree of motion;

The Ossa Ilia flatter, and more reflected outwards, by which the under part of the Abdomen is rendered more capacious, and the impregnated Uterus better supported;

The Notches of the Ossa Ilia wider, and the conjoined Surfaces of the Ossa Innominata and Os Sacrum less;

The space between the Ossa Pubis shorter from above downwards, but larger taken in a transverse direction, especially in Women who have born Children; of course, the Ligamentous Cartilage of the Symphysis thicker;

The Angle formed by the Crura of the Ossa Pubis with the Symphysis Pubis much larger; that of the Male being from 70 to 80, while in the Female the Angle extends from 80 to 90 degrees;

The

The Tuberosities of the Ossa Ischia flatter, and at a greater distance from each other;

The Brim of the Pelvis wider, and of an oval form, corresponding with the Head of the Child, and the longest Diameter extending between the Ossa Ilia.

In the Male, the Brim of the Pelvis observed to have more of a circular appearance, and to have the greatest extent between the Ossa Pubis and Os Sacrum.

The Opening at the under part of the Pelvis, in the Female, much wider, and of an oval form; but the oval the reverse of that at the Brim.

The Foramina Ovalia wider.

All the Openings at the under part of the Pelvis, being wider, leave a large passage for the Birth of the Child.

The Acetabula farther distant from each other, in consequence of which, Women who are very broad at this part of the Body waggle when they walk.

The Ossa Femorum more curved; the Neck of the Thigh-bone forming a greater Angle with its Body; the Body of the Thigh-bone placed more obliquely; the internal Condyle larger.

The Feet smaller;

The Clavicles less crooked;

The Scapulæ smaller, placed more backwards, but closer to the Thorax; of course, the breadth of the Shoulders less;

The Superior Extremities shorter;

The Hands smaller;

The Ossa Carpi narrower; and

The Fingers more tapering towards their Extremities.

PART II.

OF

THE MUSCLES.

OF THE

MUSCLES IN GENERAL.

THE MUSCLES serve for the motion of the different parts of the Body, and derive their general name from their power of contracting.

Of Muscles in general, the following things are to be attended to.

The *Cellular Substance,* which surrounds the Muscles, and allows them to move upon each other, and upon the adjacent parts.

The Cellular Substance, *condensed* in certain parts of the Body, and giving an appearance of *Membrane,* formerly called *Tunica Propria Musculorum.*

The *Division* of a Muscle into

The *Origin,* or *Head;*—or that extremity of the Muscle which arises from the most fixed part, and towards which the contraction is made;

The *Belly*, or *thickest part*, which swells when the Muscle is in action;

The *Insertion*, or *Termination*, or that extremity which is implanted into the part to be moved, and which is commonly smaller than the Origin.

The *Division* of a Muscle into *Fleshy* and *Tendinous* parts.

The *Fleshy part* distinguished by being *soft*, *sensible*, generally of a *red colour*,—from the great quantity of Blood in it,—and possessing *contractility*.

The Fleshy part, composed of a collection of somewhat elastic semi-pellucid *Fibres*, of different sizes, running frequently in a parallel direction, but often converging towards one of the extremities of the Muscle.

The Fibres are intermixed with Blood-vessels, Lymphatics, and Nerves, with some Cellular Substance and Fat.

The size of the Fibres varies in different parts of the Body; they increase as a person advances towards maturity, and they become firmer and stronger by frequent exertion.

The larger Fibres may be divided into smaller, and these into still smaller, till at length they escape the observation of the naked Eye.

The ultimate Fibres of Muscles have been considered by some as a collection of solid Cords, by many as hollow Tubes, while several have described them as being composed of a chain of little Vesicles.

The Muscular Fibres consist chiefly of *Fibrin*, with a small quantity of Gelatin, Albumen, and Saline Matter.

The *Division* of Muscles into *Rectilineal*, as in the Sartorius;—*Simple Penniform*, as in the Peroneus Longus;—*Complete Penniform*, as in the Rectus Femoris; —*Compound Penniform*, as in the fore part of the Soleus;—*Radiated*, as in the Pectoralis Major;—*Hollow*, as in the Heart, Intestines, Bladder of Urine, &c.

The *particular Names* of Muscles are taken from their *shape*, *size*, *situation*, *direction*, *composition*, *use*, and *attachment*.

The Names adopted by the Author are those in common use, being in general as expressive as any yet contrived. Those of Chaussier are added, which are taken from the attachments of the Muscles, but, in many cases, a number of principal attachments are excluded; besides, several of his names consist of so many syllables, as to become burdensome to the memory.

Muscles are supplied with *Blood-vessels*, which are so numerous, that when a good Injection is thrown into them, they acquire the same colour with that of the injected matter.

They are also abundantly supplied with *Absorbents*, which, however, are rather seen in the Cellular Texture of their Interstices, than in their Substance; the Valves preventing an Injection from passing from their Trunks to their small Extremities.

The *Nerves* of Muscles are also very numerous; but although the Muscles were called by some Authors, among others Dr Cullen, the moving Extremities of the Nerves, the latter bear a very small proportion to the former, and the Muscles appear to be quite of a different nature from the Nerves.

The Nerves of voluntary Muscles have been described by some Writers as being much larger than those of the involuntary kind, as the Heart; but this circumstance has been exaggerated.

In various parts of the Body, the Muscles receive their Nerves from different origins, and many antagonist Muscles receive Nerves from the same source.

The *Tendon*, like the Fleshy part of the Muscle, is of a Fibrous nature, but is not merely Muscle hardened by pressure, as was formerly by some Authors supposed; for, in many instances, Tendons have a different direction from the Muscles to which they belong. Tendon is distinguished from the Flesh by being generally *smaller*, *firmer*, *stronger*;—of a *white glistening colour*, having no *contractility*, and little or no *sensibility* in the sound state. From long boiling, it is observed to afford a large portion of Gelatin.

Tendons, like Muscles, vary considerably in their form, as *round*, *flat*, *annular*, &c.

Tendons have very few *Blood-vessels*, and no evident *Nerves*.

Tendons in general connect Muscles to Bones. In some places they unite Cartilages or Bones to each other. In others, they bind down and fortify parts over which they pass, and, by the smallness of their size compared to the Belly of the Muscle, preserve the elegance and symmetry of the parts on which they are placed.

Besides the parts of Muscles already taken notice of, they have the following *Appendages*, viz.

Aponeuroses, or *Fasciæ*, which are the Tendons expanded upon a wide Surface, serving to give Insertion to Muscular Fibres, to keep them in their proper situation, and to brace them in their action.

Annular Ligaments, to keep Tendons from starting.

Trochleæ, or *Pulleys*, to alter the direction of Tendons.

Bursæ Mucosæ, placed where Tendons play over hard Substances, serving to contain Synovia, and prevent Abrasion.

MUSCLES OF THE INTEGUMENTS OF THE CRANIUM, AND OF THE EYE-LIDS.

OCCIPITO-FRONTALIS,

Vel *Occipitalis et Frontalis*, vel *Epicranius, &c.*

Origin: Fleshy from near the middle of the upper arched Ridge of the Occipital Bone, and Tendinous from the extremity of that Ridge, where it joins the Temporal Bone.—It arises after the same manner on the other side. From the Fleshy Origins, and also from between them, a Tendinous Expansion is extended along the upper part of the Cranium, adhering firmly to the Skin, and but loosely to the Pericranium.—At the upper part of the Forehead it becomes Fleshy, and descends with straight Fibres, the under part of the Muscle laying hold of, or taking its Origin from, the Frontal Bone, at the inner part of the Orbits.

Insertion : Into the Skin and parts under it belonging to the Eye-brows.

Action : To move all that part of the Skin which covers it, and particularly the Skin of the Brow and the Eye-brows.

From the under and middle part of the Muscle, a *Slip*, termed by CHAUSSIER *Fronto-Nasalis*, is continued down upon the Root of the Nose, to be connected with the Compressor Naris, and Levator Labii Superioris Alæque Nasi.

This Slip may either assist the Nasal Muscles connected with it, or antagonize the Occipito-frontalis.

CORRUGATOR SUPERCILII,

By CHAUSSIER, *Fronto-Superciliaris.*

Origin : From the internal Angular Process of the Os Frontis, above the joining of that Bone with the Os Nasi. From thence it runs upwards and outwards, under a tapering form, in the direction of the Superciliary Ridge, and behind the inferior part of the Occipito-frontalis.

Insertion : Into the inner part of the Occipito-frontalis and Orbicularis Palpebrarum, where these two Muscles join each other, as far out as the middle of the Superciliary Ridge.

Action : To assist its fellow in drawing the Eye-brows downwards and inwards, and corrugating or wrinkling the Skin between them into longitudinal folds.

ORBICULARIS OCULI, vel ORB. PALPEBRARUM,
Vel *Naso-palpebralis.*

Origin: From the Orbitar Process of the Superior Maxillary Bone; from the internal Angular Process of the Frontal Bone; and, by a small round Tendon, from the Nasal Process of the superior Maxillary Bone.

From these Origins the Muscle passes outwards, under the Skin of the Eye-lids, surrounding the Orbit in a circular manner; extending somewhat beyond it, and covering the upper part of the Cheek.

Insertion: Into the Skin of the Eye-lids, its upper and inner Edge being intimately connected with the Frontal and Corrugator Muscles.

Action: To close the Eye by bringing the Eye-lids together, to press the Ball of the Eye inwards, and act upon the Lacrymal Organs, so as to assist them in the production and direction of the Tears.

That part of the Orbicularis Oculi which covers the Cartilages of the Eye-lids, and which is remarkably thin, is the *Musculus Ciliaris* of some Authors.

A *Fleshy Slip* frequently passes down from the under and outer part of the Orbicularis, to join the Levator Labii Superioris Alæque Nasi. When present, it may draw a little towards each other those parts to which it is attached.

LEVATOR PALPEBRÆ SUPERIORIS,
Vel *Orbito-palpebralis.*

Origin: From the upper margin of the Foramen Opticum of the Sphenoid Bone. It runs forwards within the Orbit over the Levator Oculi, where it becomes gradually broader, its anterior extremity passing under the Orbicularis Oculi.

Insertion: By a broad thin Tendon, into nearly the whole length of the Cartilage of the upper Eye-lid.

Action: To open the Eye by raising the upper Eye-lid.

MUSCLES COMMON TO THE HEAD AND EXTERNAL EAR.

ATTOLLENS AUREM,

Vel *Superior Auris*, vel *Temporo-auricularis.*

Origin: By a broad Tendinous Expansion, from the Tendon of the Occipito-frontalis. It goes down over the Aponeurosis of the Temporalis. In its passage, it forms a thin Fleshy Slip, which becomes gradually narrower.

Insertion: Into the upper part of the Root of the Cartilage of the Ear.

Action: To give tension to the part into which it is inserted, and, in some persons, to raise the Ear.

ANTERIOR AURIS, vel *Zygomato-auricularis.*

Origin: Thin and Membranous, near the posterior part of the Zygoma; the middle part being mixed with Fleshy Fibres.

Insertion : By a narrow Tendon into the back part of the beginning of the Helix.

Action : To stretch that part of the Ear to which it is fixed.

RETRAHENTES AUREM,
Vel *Posteriores Auris*, vel *Mastoido-auricularis.*

Origin : By two, and sometimes by three distinct Muscles, from the upper and outer part of the Mastoid Process.

Insertion : By small Tendons into the back part of the Concha.

Action : To stretch the Concha, and, in some persons, to draw back the Ear.

MUSCLES OF THE NOSE AND MOUTH.

COMPRESSOR NARIS, vel *Super-maxillo-nasalis.*

Origin : By a narrow beginning from the root of the Ala Nasi, where it is connected with the Levator Labii Superioris Alæque Nasi, and the slip which descends from the Frontal Muscle. It spreads into a number of thin scattered Fibres, which cross the Ala Nasi, and run towards the Dorsum of the Nose. It arises also from the anterior extremity of the Nasal Bone.

Insertion: Into its fellow of the opposite side, over the anterior Nasal Suture.

Action: To press the Ala towards the Septum, as in smelling; or if the Fibres of the Frontal Muscle, which are connected to it, act, they pull the Ala outwards. It also corrugates the Skin of the Nose, and assists in expressing certain passions.

LEVATOR LABII SUPERIORIS ALÆQUE NASI,
Vel *Super-maxillo-labialis Major et Medius.*

Origin: By two thin Fleshy Slips; the first from the external part of the Orbitar Process,—the second from the upper part of the Nasal Process of the Superior Maxillary Bone.

Insertion of the first part of the Muscle into the Upper Lip, and of the second into the Upper Lip, and outer part of the Wing of the Nose.

Action: To raise the Upper Lip in opening the Mouth, and the Ala Nasi in dilating the Nostril.

Under this Muscle a few scattered Fibres are noticed by SOEMMERRING, and termed *Musculus Anomalus Maxillæ Superioris.*

DEPRESSOR LABII SUPERIORIS ALÆQUE NASI.

Origin: Thin and Fleshy, from the Alveoli of the Dentes Incisivi and Caninus of the Upper Jaw; running upwards, at the side of the Furrow of the Lip.

Insertion: Into the Upper Lip, and Root of the Ala Nasi.

Action: To draw the Upper Lip and Ala Nasi downwards.

Levator Anguli Oris,

Vel *Levator Labiorum Communis*, vel *Caninus*, vel *Super-maxillo-labialis Minor.*

Origin: Thin and Fleshy, from the superior Maxillary Bone, immediately under the Foramen Infra-orbitarium;—running deeper down and farther out than the Levator Labii Superioris.

Insertion: Into the Angle of the Mouth, and to the Cheek, where it joins its Antagonist.

Action: To raise the corner of the Mouth;—as in expressing joy.

Depressor Labii Inferioris,

Vel *Quadratus Genæ*, vel *Mento-labialis.*

Origin: Broad and Fleshy, from the under part of the Lower Jaw, at the side of the Chin; from thence it runs obliquely upwards and inwards, of an oblong form, till it becomes contiguous to its fellow in the middle of the Lip. Its origin is concealed by the Depressor Anguli Oris.

Insertion: Into one half of the Edge of the Under Lip.

Action: To assist in opening the Mouth, by depressing the Under Lip, and pulling it a little outwards.

LEVATOR LABII INFERIORIS, vel *Levator Menti.*

Origin : From the Roots of the Alveoli of the Dentes Incisores and Dens Caninus of the Lower Jaw.

Insertion : Into the Under Lip and Skin of the Chin.

Action : To raise the parts into which it is inserted. It may also assist in inverting the Under Lip.

DEPRESSOR ANGULI ORIS,

Vel *Triangularis,* vel *Maxillo-labialis.*

Origin : Broad and Fleshy, from the under edge of the Lower Jaw, at the side of the Chin.—It runs over the Origin of the Depressor Labii Inferioris, becoming gradually narrower.

Insertion : Into the Angle of the Mouth, where it intermixes with the Levator Anguli Oris.

Action : To depress the corner of the Mouth;—as in expressing Anger, and in crying.

ZYGOMATICUS MAJOR, vel *Zygomato-labialis Major.*

Origin : Fleshy from the Os Malæ, near the Zygomatic Suture.—Descending obliquely forwards.

Insertion : Into the Angle of the Mouth, its Fibres intermixing with those of the Depressor Anguli Oris and Orbicularis Oris.

Action : To raise the Angle of the Mouth, in the direction of its Fibres, and to make the Cheek prominent;—as in laughing.

ZYGOMATICUS MINOR, vel *Zygomato-labialis Minor.*

Origin: Higher on the Os Malæ than the former Muscle. It is situated before it, and takes the same course, but is much more slender.

Insertion: Into the Upper Lip, along with the Levator Anguli Oris.

Action: To assist the former Muscle in raising the Corner of the Mouth, and drawing it obliquely outwards.

This Muscle is often wanting.

By the frequent action of the Muscles which raise the Corners of the Mouth and Upper Lip, that Furrow is formed which extends between the outer Corners of the Nose and Mouth, and which is so conspicuous in the Face of a person advanced in life.

BUCCINATOR,

Vel *Retractor Anguli Oris*, vel *Bucco-labialis.*

Origin: From a Ridge extending between the last Dens Molaris and Coronoid Process of the Lower Jaw; and from the Upper Jaw, between the last Dens Molaris and Pterygoid Process of the Sphenoid Bone, from the extremity of which it has also part of its origin. Thence going forwards with straight Fibres, it covers and adheres closely to the Membrane which lines the Cheek.

Insertion: Into the Corner of the Mouth, along with the Orbicularis Oris.

Action: To draw the Angle of the Mouth backwards and outwards, and to contract its Cavity by pressing the Cheek inwards, in consequence of which the Food is thrust between the Teeth in Manducation.—It is likewise active in expelling Substances from the Mouth, and in blowing Wind-instruments, as a Trumpet, from which last circumstance its name is derived.

ORBICULARIS ORIS,

Vel *Sphincter Labiorum*, vel *Labialis.*

This is a complete Sphincter surrounding the Mouth, and composing the principal part of the Lips, and is in a great measure formed by the Muscles which terminate in it.—At the Corners of the Mouth, the Fibres decussate each other, so as to make it resemble two semicircular Muscles, from which it has been named by some Authors, *Semi-orbicularis Superior*, and *Semi-orbicularis Inferior.*

Action: To shut the Mouth,—to enable the Lips to embrace any Substance placed between them, and to counteract the different Muscles inserted into them.

Nasalis Labii Superioris of Albinus,—part of the former Muscle, running up to be connected to the Septum Nasi, and serving as a Levator of the Upper Lip, or a Depressor of the under part of the Nose.

Of the Muscles described above, the NOSTRILS are *compressed* by the Compressores Narium and Depressores Labii Superioris Alarumque Nasi;—*opened* by the Levatores Labii Superioris Alarumque Nasi, and Fronto-nasalis. The SEPTUM NASI is *pulled down* by the Nasalis Labii Superioris, and *raised* by its own Elasticity.

The MOUTH is *opened* by the Levatores Labii Superioris Alarumque Nasi, Levatores Angulorum Oris, Zygomatici Majores et Minores, Depressores Labii Inferioris, and Depressores Angulorum Oris;—*shut* by the Orbicularis Oris, Depressores Labii Superioris Alarumque Nasi, Levatores Labii Inferioris,—and *moved laterally* by the Buccinatores.

The Corners of the Mouth are *raised* by the Levatores Angulorum Oris, Zygomatici Majores et Minores, and *depressed* by the Depressores Angulorum Oris.

MUSCLES OF THE LOWER JAW.

APONEUROSIS TEMPORALIS.

This is a strong Tendinous Membrane, proper to be taken notice of before describing the Temporalis. It arises from the Bones which give origin to the upper semicircular part of the Temporal Muscle, and, descending over it, is fixed to the whole upper edge of the Zygoma.

Use: To brace the whole, and to give origin to part of the Temporal Muscle.

TEMPORALIS, vel *Temporo-maxillaris.*

Origin: Semicircular and Fleshy, from the lower half of the Parietal Bone, and Temporal Fossa of the Frontal and Cheek Bones; and from the Squamous part of the Temporal, and Temporal Plate of the Sphenoid Bone.—It arises likewise from the Aponeurosis covering it.—From these Origins the Fibres descend like Radii, and the Muscle sends off a strong Tendon, which passes under the Zygoma.

Insertion: Into the whole of the Coronoid Process of the Lower Jaw, which it incloses as in a sheath, and is continued to near the last Dens Molaris.

Action: To pull the Lower Jaw upwards, and a little backwards against the Upper Jaw.

MASSETER, vel *Zygomato-maxillaris.*

Origin: By strong Tendinous and Fleshy Fibres from the Superior Maxillary Bone, where it joins the Os Malæ, and from the whole length of the under and inner Edge of the Zygoma;—the outer part of the Muscle slanting backwards, the inner part forwards, and in some measure decussating the other. In its descent, it covers the Coronoid Process, and under end of the Temporal Muscle.

Insertion: Into the outer side of the Angle of the

Lower Jaw, and from that upwards to the outside of the Coronoid Process.

Action: To assist the Temporalis in the elevation of the Lower Jaw, and to pull it a little forwards or backwards, according to the direction of the Fibres of the Muscle.

PTERYGOIDEUS INTERNUS, vel *Major*,
Vel *Pterygo-maxillaris Major.*

Origin: From the Fossa Pterygoidea of the Sphenoid and Palate Bones; passing downwards and outwards.

Insertion: Into the inner side of the Angle of the Lower Jaw, and continued as far as the Groove for the inferior Maxillary Nerve.

Action: To raise the Jaw, and draw it obliquely towards the opposite side.

PTERYGOIDEUS EXTERNUS, vel *Minor*,
Vel *Pterygo-maxillaris Minor.*

Origin: From the outer side of the Pterygoid Process of the Sphenoid Bone; from the Tuberosity of the superior Maxillary Bone; and from the Root of the Temporal Process of the Sphenoid Bone. From these Origins it passes almost horizontally outwards, and a little backwards.

Insertion: Into the Cervix and Capsular Ligament of the Lower Jaw.

Action: To pull the Lower Jaw to the opposite side, and, if both Muscles act, to bring it forwards, so as to make the Fore-teeth project beyond those of the Upper Jaw. The Muscle, in its different motions, acts also upon the Inter-articular Cartilage.

The Lower Jaw is *raised* by the Temporales, Masseteres, and Pterygoidei Interni;—*depressed* by the Digastrici, Platysmæ Myoides, Mylo-hyoidei, and Genio-hyo-glossi;—*moved forwards* by the Masseteres, Pterygoidei Externi, and Mylo-hyoidei;—*Backwards* by the Temporales, Masseteres, Digastrici, Genio-hyoidei, and Genio-hyo-glossi;—and *laterally*, by the Pterygoidei Externus et Internus, acting upon one side or the other alternately.—By a succession of the above motions grinding is performed.

MUSCLES ON THE FORE AND LATERAL PART OF THE NECK.

PLATYSMA MYOIDES, vel *Cutaneus*, vel *Thoraco-facialis*.

Origin: By a number of separate Fleshy Slips, from the Cellular Substance, which covers the upper parts of the Pectoral and Deltoid Muscles.—In their ascent, they unite to form a thin Muscular Expansion, which runs obliquely upwards along the fore and lateral part of the Neck, adhering to the Skin, and is similar to the Cutaneous Muscle of Quadrupeds.

Insertion: Into the side of the Lower Jaw and the

Depressor Anguli Oris, and into the Skin which covers the under parts of the Masseter, and Parotid Gland.

Action: To assist in depressing the Lower Jaw, the Corner of the Mouth, and the Skin of the Cheek;—when the Jaws are shut, to raise all that part of the Skin connected with it under the Lower Jaw.

STERNO-CLEIDO-MASTOIDEUS, vel *Sterno-mastoideus.*

Origin: From the top of the Sternum, and the anterior end of the Clavicle, by two distinct Heads; the first of which is round, tendinous, and a little fleshy; the other broad and fleshy. A little above the Clavicle, the two Heads unite to form a strong Muscle, which runs obliquely upwards and outwards; the greater part of it being covered by the Platysma Myoides.

Insertion: By a thick strong Tendon, into the Mastoid Process, which it surrounds; and becoming thinner, the Insertion extends as far back as the outer end of the great transverse Arch of the Occipital Bone.

Action: To turn the Head to one side, and assist in rolling it. When both Muscles act, they bow the Head. But if the Head be pulled back, by the Muscles upon the posterior part of the Neck, till the Insertion of this Muscle gets behind the centre of motion, it then becomes a Flexor backwards.

MUSCLES SITUATED BETWEEN THE OS HYOIDES AND TRUNK.

STERNO-HYOIDEUS.

Origin: From the Edge of the upper Bone of the Sternum internally, and from the adjacent parts of the Clavicle and Cartilage of the first Rib;—ascending upon the fore part of the Trachea and following Muscle.

Insertion: Into the Base of the Os Hyoides.

Action: To depress the Os Hyoides.

STERNO-THYROIDEUS.

Origin: From the upper and inner part of the Sternum, and partly from the Cartilage of the first Rib; running along the fore part and side of the Trachea and Thyroid Gland.

Insertion: Into the under and lateral part of the Thyroid Cartilage.

Action: To depress the Larynx.

THYRO-HYOIDEUS, vel *Hyo-thyroideus.*

Origin: From the Thyroid Cartilage, where the former Muscle terminates, having the appearance of being continued from it.

Insertion: Into part of the Base, and almost all the Cornu of the Os Hyoides.

Action: To depress the Os Hyoides, or to raise the Thyroid Cartilage.

CRICO-THYROIDEUS.

Origin: From the side and fore part of the Cricoid Cartilage; running obliquely upwards and outwards.

Insertion: By two portions; the one into the under part of the Wing of the Thyroid Cartilage, the other into its inferior Cornu.

Action: To depress and pull forwards the Thyroid Cartilage, or to raise and draw backwards the Cricoid Cartilage.

OMO-HYOIDEUS.

Origin: From the Superior Costa of the Scapula, near the Semilunar Notch. It goes obliquely upwards and forwards, and is of a very slender form. It crosses under the Sterno-mastoideus, and there it grows Tendinous. Higher than this Muscle, it again becomes Fleshy.

Insertion: Into the Base of the Os Hyoides, at the side of the Sterno-hyoideus.

Action: To depress the Os Hyoides, and pull it to one side; or, when both Muscles act, to draw it directly downwards.

MUSCLES SITUATED BETWEEN THE LOWER JAW AND OS HYOIDES.

DIGASTRICUS,

Vel *Biventer Maxillæ Inferioris*, vel *Mastoido-mentalis.*

Origin: By a Fleshy Belly, from the Groove at the Root of the Mastoid Process of the Temporal Bone. It runs downwards and forwards, and forms a strong round Tendon, which passes through the Stylo-hyoideus;—it is then fixed by a Ligament to the Os Hyoides, and, having received an addition of Tendinous and Muscular Fibres, it runs obliquely upwards and forwards, forming another Fleshy Belly.

Insertion: Into a rough Sinuosity at the under part of the Symphysis of the Lower Jaw.

Action: To open the Mouth by pulling the Lower Jaw downwards and backwards; and when the Jaws are shut, to raise the Os Hyoides, and of course the Throat,—as in swallowing. When the Lower Jaw is fixed, this Muscle, according to SOEMMERRING, can extend the Head, and thereby open the Mouth, by elevating the Upper Jaw. This he thinks he has observed in a child sucking.

MYLO-HYOIDEUS, vel *Maxillo-Hyoideus.*

Origin: Fleshy, broad, and thin, from the inside of the Lower Jaw, between the last Dens Molaris and the middle of the Chin, where it joins its fellow; running downwards and forwards behind the anterior belly of the Digastricus.

Insertion: Into the lower edge of the Body of the Os Hyoides, and joined to its fellow by the intervention of a white Tendinous Line.

Action: To pull the Os Hyoides forwards, upwards, and to a side, or, when that Bone is fixed, to assist in the depression of the Jaw.

GENIO-HYOIDEUS.

Origin: From a Tubercle on the under and inner part of the Symphysis of the Lower Jaw, by a slender beginning, from which it goes obliquely downwards and backwards on the inner side of the former Muscle.

Insertion: Into the Body of the Os Hyoides.

Action: To draw the Os Hyoides towards the Chin, when the Jaws are shut; or the Chin towards the Os Hyoides, when the latter is fixed by the Muscles which come from the Sternum.

GENIO-HYO-GLOSSUS.

Origin: From the same Tubercle with the former Muscle; its Fibres spreading out like a Fan.

Insertion: Into the whole length of the Tongue, and into the Base of the Os Hyoides.

Action: According to the direction of its Fibres,—to draw the Tongue forwards or backwards,—to pull it downwards, and render its Dorsum concave,—and when the Jaws are shut, to make the Os Hyoides advance towards the Chin.

HYO-GLOSSUS.

Origin: From one of the Cornua, and half of the Base of the Os Hyoides; running upwards and a little outwards.

Insertion: Into the side of the Tongue, near the Stylo-glossus.

Action: To depress the edge of the Tongue, and thereby render its upper Surface convex.

LINGUALIS.

Origin: From the root of the Tongue, laterally. It advances between the Genio-hyo-glossus and Hyoglossus, with the Fibres of both of which it intermixes.

Insertion: Into the point of the Tongue.

Action: To raise the point of the Tongue, to contract the Substance of the latter, and bring it backwards.

STYLO-GLOSSUS.

Origin: From the Styloid Process of the Temporal Bone, and from the Ligament which connects that Process to the Angle of the Lower Jaw. It goes downwards and forwards, and is of a slender form.

Insertion: Into the root of the Tongue, near the Hyo-glossus; and running along its side, it is insensibly lost towards the Apex.

Action: To draw the Tongue upwards and backwards, and to move it laterally.

The TONGUE is *raised*, anteriorly, by the Linguales, and posteriorly, and pressed against the Palate, by the Stylo-glossi;—*depressed*, and turned down anteriorly, by the Genio-hyo-glossi;—*carried forwards*, and lengthened, by the Genio-hyo-glossi;—*backwards* and shortened, by the Linguales, Stylo-glossi, and Genio-hyo-glossi;—moved *laterally* by the Stylo-glossi acting alternately;—rendered *concave* above, and *convex* below, by the Genio-hyo-glossi; and made *narrower*, *convex* above, and *concave* below, by the Hyo-glossi.

STYLO-HYOIDEUS.

Origin: From the under half of the Styloid Process. It goes downwards and forwards, splitting for the passage of the Digastricus.

Insertion: Into the Os Hyoides, at the junction of the Base and Cornu.

Action: To pull the Os Hyoides to one side, and a little upwards.

STYLO-HYOIDEUS ALTER.

When present, it is a more slender Muscle than the former, but, like it, has nearly the same Origin, Insertion, and Action.

STYLO-

STYLO-PHARYNGEUS.

Origin: From the root of the Styloid Process;—it goes downwards and forwards.

Insertion: Into the side of the Pharynx, along which it expands.—It is also fixed to the back part of the Thyroid Cartilage.

Action: To dilate and raise the Pharynx, and thereby prepare it to receive the Morsel from the Mouth. It at the same time elevates the Thyroid Cartilage.

CIRCUMFLEXUS PALATI,

Vel *Tensor Palati*, vel *Pterygo-palatinus.*

Origin: From the Spinous Process of the Sphenoid Bone, from the Osseous and Cartilaginous parts of the EUSTACHIAN Tube, and from the root of the Internal Pterygoid Process. It runs along the Pterygoideus Internus, passes over the Hook of the Internal Plate of the Pterygoid Process; and playing on it by a round Tendon, as on a Pulley, it spreads out into a broad Membrane.

Insertion: Into the Velum Palati, and semilunar edge of the Os Palati, extending as far as the Suture which joins the two Bones. Generally some of its posterior Fibres join the Constrictor Pharyngis Superior and Palato-pharyngeus.

Action: To depress, and stretch the Velum laterally.

LEVATOR PALATI,

Vel *Levator Palati Mollis,* vel *Petro-palatinus.*

Origin: From the point of the Pars Petrosa of the Temporal Bone, and also from the Membranous Portion of the EUSTACHIAN Tube. From these parts it descends.

Insertion: By a broad Expansion, into the Velum Palati, extending as far as the root of the Uvula, and uniting with its fellow.

Action: To raise the Velum in the time of Swallowing, and prevent the food or drink from passing into the Nose, by pressing the Velum against the back part of the Nostrils.

CONSTRICTOR ISTHMI FAUCIUM,

Vel *Glosso-palatinus.*

Origin: From the side of the root of the Tongue. It consists of a few thin Fibres, which run in the doubling of the Skin that forms the anterior Arch of the Palate.

Insertion: Into the middle of the Velum Palati, at the root of the Uvula, where it is connected with its fellow.

Action: To draw the Palate and root of the Tongue towards each other, and thereby to shut the Opening into the Fauces.

PALATO-PHARYNGEUS, vel *Pharyngo-palatinus.*

Origin: From the middle of the Velum Palati, at the root of the Uvula; and from the Insertion of the Constrictor Isthmi Faucium and Circumflexus Palati. The Muscle consists of a thin Stratum of Fibres, which proceed within the posterior Arch of the Palate, and run to the upper and lateral part of the Pharynx, where they spread, and mix with those of the Stylo-Pharyngeus.

Insertion: Into the edge of the upper and back part of the Thyroid Cartilage; some of its Fibres being lost between the Membrane and inferior Constrictors of the Pharynx.

Action: To draw the Velum and Uvula downwards, the Larynx and Pharynx being at the same time raised; along with the Constrictor Pharyngis Superior and Tongue, to assist in shutting the passage into the Nostrils; and, in Swallowing, to convey the food from the Fauces into the Pharynx.

The SALPINGO-PHARYNGEUS of ALBINUS is composed of a small portion of the former Muscle, which arises from the EUSTACHIAN Tube, and which, when acting, may affect it.

AZYGOS UVULÆ, vel *Palato-uvularis.*

Origin: From the posterior extremity of the longitudinal Palate Suture. It runs in the middle of the Velum Palati, and goes through the whole length of the Uvula, inclosed in the Membrane covering that Body, and adheres in its passage to the Circumflexi.

Insertion: Into the point of the Uvula.

Action: To shorten the Uvula.

MUSCLES SITUATED UPON THE BACK PART OF THE PHARYNX.

CONSTRICTOR PHARYNGIS INFERIOR,

Vel *Laryngo-Pharyngeus.*

Origin: From the sides of the Thyroid and Cricoid Cartilages. The superior Fibres, running obliquely upwards, cover the under part of the following Muscle, and terminate in a point; the inferior Fibres run more transversely, and cover the beginning of the Esophagus.

Insertion: Into its fellow, by the medium of a longitudinal Tendinous line in the middle of the back part of the Pharynx.

Action: To compress the lower part of the Pharynx, and to draw it and the Larynx a little upwards.

CONSTRICTOR PHARYNGIS MEDIUS,

Vel *Hyo-pharyngeus.*

Origin: From the Appendix and Cornu of the Os Hyoides, and also from the Ligament which connects the Cornu to the Thyroid Cartilage. In its passage it spreads out, and terminates in a point both above and below; the upper part covering the following Muscle, and laying hold of, or taking its Origin from, the Cuneiform Process of the Occipital Bone, before the Foramen Magnum.

Insertion: Into its fellow on the opposite side by a Tendinous Line, in a similar manner to the former Muscle.

Action: To compress the middle and upper part of the Pharynx.

CONSTRICTOR PHARYNGIS SUPERIOR,

Vel *Cephalo-pharyngeus.*

Origin: From the Cuneiform Process of the Occipital Bone, before the Foramen Magnum; from the Pterygoid Process of the Sphenoid Bone, and from both Jaws, near the last Dentes Molares: It is likewise connected with the Buccinator, and with the root of the Tongue and Palate. From these Origins, it runs almost horizontally.

Insertion: Into its fellow, by the intervention of a Tendinous line, as in the former Muscle.

Action: To compress the upper part of the Pharynx, and, with the assistance of the other Constrictors, to thrust the Food down into the Esophagus.

The OS HYOIDES, LARYNX, and PHARYNX, being intimately connected together, follow each other, less or more, in their different motions. They are *elevated* by the Mylo-hyoidei, Genio-hyoidei, Genio-hyo-glossi, Stylo-hyoidei, Digastrici, and Constrictores Pharyngis; —*depressed* by the Sterno-hyoidei, Thyro-hyoidei, and Omo-hyoidei;—*moved laterally*, by the above Muscles of the right and left sides acting alternately;—*carried obliquely*, and in every other direction, according to the situation and course of the different Muscles fixed to them.

MUSCLES OF THE GLOTTIS.

CRICO-ARYTENOIDEUS POSTICUS.

Origin: Broad and Fleshy, from the back part of the Cricoid Cartilage.

Insertion: By a narrow extremity, into the back part of the Base of the Arytenoid Cartilage.

Action: To pull back the Arytenoid Cartilage, by which the Ligament of the Glottis is made tense, and the Glottis itself longer.

CRICO-ARYTENOIDEUS LATERALIS.

Origin: From the side of the Cricoid Cartilage, where it is covered by the Thyroid.

Insertion: Into the side of the base of the Arytenoid Cartilage.

Action: To open the Glottis, by separating the Arytenoid

Insertion: Into the Epiglottis, along with the former Muscle.

Action: To assist its fellow, in drawing the Epiglottis immediately down upon the Glottis, in the time of Swallowing.

The two last-mentioned Muscles are obscurely seen, excepting in robust Bodies.

By the Crico-arytenoidei Postici, and Arytenoidei Transversus et Obliqui, the GLOTTIS is made *longer*, its Ligaments rendered *tense* and brought together, as in forming *acute sounds*.—By the Crico-arytenoidei Laterales, and Thyro-arytenoidei, the GLOTTIS is *opened*, its Ligaments *shortened* and *relaxed*, as in forming *grave sounds*.—By the Thyro-epiglottidei and Aryteno-epiglottidei, assisted by the pressure of the root of the Tongue, the EPIGLOTTIS is made to cover and completely shut up the GLOTTIS, in the time of Swallowing; the EPIGLOTTIS rises again by its own elasticity, the Tongue at the same time being carried forwards.

MUSCLES SITUATED ON THE ANTERIOR AND LATERAL PARTS OF THE ABDOMEN.

PREVIOUS to the description of the Abdominal Muscles, it is proper to take notice of certain Expansions or Fasciæ covering the first of these.

Over the Tendon of the Muscle called External Oblique, there is a thin Expansion, termed *Superficial Fascia*, consisting chiefly of Transverse Fibres. This can also be traced down upon the fore part of the Thigh. It adheres to the whole length of the Crural Arch. Part of it is fixed to Ligaments about the root of the Penis and Clitoris. It sends also a Sheath along the Spermatic Cord as far as the Scrotum, the rest of it spreads over the Inguinal Glands, and vanishes in the Fat of the Thigh.

The whole of this Fascia is frequently so thin, as to appear little else than Cellular Substance condensed. In the inflamed state, however, it sometimes becomes remarkably thick. It forms the outer, or Superficial Fascia, in Inguinal and Crural Herniæ.

Under the Superficial Fascia, on the Thigh, there is a thick and strong Aponeurosis, which arises from the fore part of the Spine of the Ilium, from the whole under edge of the Crural Arch, and from the upper and fore part of the Os Pubis. This forms a portion of the *Fascia Lata Femoris*, (to be afterwards taken notice of), which incloses the Muscles upon the Thigh.

The part arising from the Ilium and Crural Arch is termed *Ilial*, and that from the Pubis, *Pubal portion* of the Fascia Lata. The Ilial and Pubal portions are united behind the upper end of the Vein termed *Saphena Major*, and form a considerable Angle at the inner side of the Femoral Vessels, and between the Muscles on the fore and those of the inner side of the Thigh.

The upper and inner part of the Ilial Portion, forms a *Semilunar Edge*, which is concave towards the inner part of the Thigh, and is described by MR BURNS, in the Edinburgh Medical and Surgical Journal for 1806, under the name of *Falciform Process*. This leaves a *large Opening*, where the Vena Saphena Major, ascending upon the Pubal Portion of the Fascia Lata, terminates in the Femoral Vein.

This Process covers the great Femoral Blood-vessels, and anterior Crural Nerves, directly after their exit from the Abdomen.

At the edge of the Falciform Process, there is some Fat and Cellular Substance; here also a Gland is commonly placed, and sometimes two, through which several of the Superficial Lymphatics of the Thigh pass in their course towards the Abdomen. At this part of the Thigh, the portion of the Bowels passing through the Crural Ring, protrudes in Femoral Hernia.

Frequently the Semilunar Edge of the Fascia is indistinct, the Ilial and Pubal Portions being then confusedly united by an intermixture of Tendinous and Cellular Substance.

Behind the Great Vessels and Nerves of the Thigh, part of the Pubal Portion of the Fascia is continued down, to be fixed to the Os Femoris, as far as the place where the Femoral Artery perforates the Triceps Muscle.

OBLIQUUS DESCENDENS EXTERNUS,

Vel *Obliquus Externus Abdominis*, vel *Costo-Abdominalis.*

Origin: In a serrated manner, from the lower edge of the eight inferior Ribs, near their Cartilages. The Serræ intermix with the Indentations of the Serratus Major Anticus, and the Muscle is commonly connected with the Pectoralis Major, Intercostales, and Latissimus Dorsi; the last of which covers the edge of a portion of it, extending from the twelfth Rib to the Spine of the Os Ilium from the anterior half of which it has also part of its origin.

From these attachments the Fibres of the Muscle run obliquely downwards and forwards, and terminate (sometimes by distinct indentations) in a broad Tendon, or Aponeurosis, which, near its margin, is firmly connected with the Tendon of the two following Muscles, where it forms a curved line, called *Linea Semilunaris.* From this the Tendinous Fibres are continued in the same direction with the Fleshy Fibres, to the middle of the Abdomen.

Insertion : Into its fellow of the opposite side, by the medium of a Tendinous Line, which extends from the Cartilago Ensiformis to the Pubis, and is known by the name of *Linea Alba.*

The Linea Alba is formed by the meeting of the Tendons of the Oblique and Transverse Muscles of the opposite sides of the Abdomen, and is perforated in the middle by the Umbilicus,—originally a passage for the Umbilical Cord, and now formed into a Cicatrix.

The Tendon of this Muscle is strengthened by other Tendons of a more delicate nature, lying upon its outer surface. These decussate it, in a curved direction, upwards and inwards, and are intimately connected with, or take their origin from, the under end of the Tendon of the Muscle.

The under part of the Tendon, thicker and stronger than the rest of it, extends from the Superior-anterior Spinous Process of the Os Ilium, over the Flexor Muscles and great Vessels and Nerves of the Thigh to the upper part of the Os Pubis, to which it is fixed.

This part of the Tendon, which was formerly described by the name of Poupart's, or Fallopius's, or *Inguinal Ligament*, forms a curve behind, but more especially over the Blood-vessels, and therefore is now known by the name of *Crural Arch*.

Somewhat higher, and farther out, than the Symphysis Pubis, or about an inch and a half in a full-sized Adult, Poupart's Ligament divides into an upper and under column.

The upper column is fixed to the Ligament of the Symphysis Pubis, and to the Os Pubis of the opposite side. The under one is twisted or doubled in, and inserted into the upper part of the Os Pubis, and Pubal portion of the Linea Ilio-pectinea, from the Femoral Vessels, as far as the Crest or Tuberosity of the Bone, and forms a firm sharp line towards the Abdomen, which constitutes the posterior edge of the Crural Arch, or forms the *Crural Ring* of Gimbernat, of late so frequently mentioned by Surgeons.

The posterior edge of the Crural Arch is quite tense, when the Limb is extended; but when the Thigh is much bent, the edge of the Arch is relaxed, so as to favour the return of the Bowels in the reduction of Crural Hernia.

The under column is looser and more slender in the Female than in the Male; and the space between the Femoral Vessels and the insertion of this part of the Ligament is larger; in consequence of which, Protrusions of the Bowels happen here more frequently in Women.

Where the columns separate, a space is left, of an oval form, or rather like the barrel of a Quill cut obliquely, with the large end of the opening outermost. It is about an inch in length in the Male, but less in the Female, the direction running upwards and outwards, or somewhat in a line between the Pubis and Spine of the Ilium. This is the *Ring* of the *External Oblique Muscle*, or *Under Abdominal*, or *Spermatic*, or *Supra-pubial Ring*, for the transmission of the Spermatic Cord in the Male, and the round Ligament of the Uterus in the Female, and where the Bowels protrude in Inguinal Hernia.

Surrounding the exit of the Cord, or the round Ligament, from the Ring there is a quantity of Cellular Substance, and some Tendinous Fibres, which assist in filling up that opening, and in preventing any communication between the outer and inner parts.

The place where the columns separate to form the

Ring varies in different Subjects. In some, the separation is considerably farther out than the part already described, though more generally the division is directly at the outer part of the Ring. At this end of the Ring, the columns are joined by Tendinous Fibres, which arise from the Os Ilium, and from POUPART'S Ligament; and are part of the Fibres mentioned above, as decussating the Tendon of the External Oblique Muscle.

Through the Abdominal Ring, there is no direct opening into the Cavity of the Abdomen; the passage being shut by the Obliquus Internus and Transversalis Abdominis, and by the *Fascia Transversalis*.

Action of the Obliquus Externus: To support and compress the Peritoneum and Bowels of the Abdomen; to assist in the evacuation of the Fæces and Urine, and in the exclusion of the Fœtus; to thrust the Diaphragm upwards, and draw down the Ribs in Expiration; to bend the Body obliquely to one side when a single Muscle acts, and directly forwards when both act; and to raise the Pelvis when the Thorax is fixed.

OBLIQUUS ASCENDENS INTERNUS,

Vel *Obliquus Internus Abdominis*, vel *Ilio-abdominalis.*

Origin: From the back part of the Os Sacrum;—from the Spinous Processes of the three lowest Lumbar Vertebræ, by a Tendon common to it and the Serratus Posticus Inferior and Latissimus Dorsi;—from the whole length of the Spine of the Os Ilium;—and from the inside of POUPART'S Ligament, at the middle of which it sends off the Cremaster. From these Origins the Fibres are disposed in a radiated manner; but the greater part of them run in a slanting direction upwards.

At the Linea Semilunaris, the Muscle becomes Tendinous, and adheres firmly to the Tendon of the Obliquus Externus. Here its Tendon divides into two Layers: the anterior Layer, with the greater part of the inferior portion of the posterior Layer, joins the Tendon of the External Oblique, and goes over the Rectus, to be inserted into the Linea Alba. The posterior Layer joins the Tendon of the Transversalis, and goes behind the Rectus; and this union is continued down, till it reaches about half way between the Umbilicus and Os Pubis. Lower than this, only a few scattered Fibres of the Posterior Layer are to be found behind the Rectus; the principal part of it passing before that Muscle, to be inserted into the Linea Alba.

Insertion: Into the Cartilages of all the False Ribs; into the Cartilago Ensiformis, and whole length of the Linea Alba.

Action: To assist the former Muscle. It bends the Body, however, in the same direction with the Obliquus Externus of the opposite side. So that these two may, in some respects, be considered as forming a double-bellied Muscle.

TRANSVERSALIS,

Vel *Transversus Abdominis*, vel *Lumbo-abdominalis.*

Origin: Fleshy from the inner Surface of the Cartilages of the six or seven Lower Ribs, where it intermixes with the Digitations of the Diaphragm, and with the Intercostal Muscles; from the transverse Processes of the twelfth Dorsal and four superior Lumbar Vertebræ; from the whole inner edge of the Spine of the Os Ilium; and anterior to this, it is connected to the under edge of the Obliquus Externus. At the Linea Semilunaris, the Muscle changes into Tendon, which is continued across, adhering to the Obliquus Internus in the manner already mentioned.

Insertion: Into the Cartilago Ensiformis and Linea Alba.

Action: To support, and immediately to compress, the Abdominal Bowels.

From the inside of the Crural Arch, and from the Spine of the Ilium, a Tendinous Aponeurosis, termed *Iliac Fascia*, is sent off, which is reflected over the Iliacus Internus, and Psoas Magnus, which it braces and protects. It descends afterwards between the Psoas and External Iliac Vessels, to give a lining to the Bones, Muscles, and Ligaments, at the inner side of the Pelvis. It is firmly attached to the Linea Ilio-pectinea, and behind the Origin of the Crural Vessels, is incorporated with the Pubal part of the Fascia Lata, in such a manner, that the one may in a great measure be considered as a continuation of the other.

From the Crural Arch, from the Iliac Portion of the Linea Ilio-pectinea, and reflected also from the under part of the Expansion covering the Iliacus Internus, another Aponeurotic Expansion, of a thin and delicate nature, the *Fascia Transversalis* of MR COOPER, is sent upwards, which lines the under part of the inner side of the Transversalis, lies between it and the Peritoneum, and vanishes in its ascent in the Abdomen.

The Angle of reflection between these two Expansions being formed of strong Tendinous Fibres, the Abdomen at this place is fortified, and the Bowels are prevented from protruding between the Spine of the Ilium and Iliac Blood-vessels.

Besides these Expansions, others are mentioned by late Authors, as being sent down to inclose the Femoral Vessels at the upper part of the Thigh, so as to form what is called the *Crural Sheath.*

The beginning of the Crural Sheath, or that part next the Cavity of the Pelvis, is formed anteriorly by the Fascia Transversalis, Crural Arch, and Cellular Substance blended together, posteriorly by the conjoined Fascia Iliaca, Pubal part of the Fascia Lata, and Cellular Substance. The anterior and posterior portions of the Fascia uniting together at the sides of the Blood-vessels, form the lateral parts of the Sheath.

Lower than the Crural Arch, and extending as far as the Perforation in the Tendon of the Great Adductor Muscle of the Thigh, the Artery is covered before by the Fascia Lata, behind by the deep part, or Pubal portion of that Fascia, and laterally by the two Fascia conjoined by Cellular Substance.

The Sheath and Vessels it incloses, at the upper part of the Thigh, with the External Iliac Vessels also at the inner part of the Pelvis, are strengthened by some Tendinous Slips, which run between, and also at the sides of the Vessels; uniting them together, to the Crural Arch before, and to the Bones behind, over which they pass.

Within the Fasciæ, the Vessels are closely connected together, as the Great Vessels in the Neck are, by a Vagina of Cellular Substance condensed, and which may be considered as the *proper Sheath* of the Great Vessels situated in the Thigh.

Between the inner part of the External Iliac Vein, and the Insertion of the under column of POUPART's Ligament into the Os Pubis, and having the Os Pubis behind covered by its Ligament, a triangular space is left, at the outer part of which there is a small Aperture, which forms the *Crural Foramen* of GIMBERNAT. The triangular Cavity and Aperture are more considerable in the Female than in the Male, on account of the greater width of the Pelvis. Through this Foramen the Bowels protrude in Femoral Hernia. In the Male the opening is more filled up, in consequence of the greater thickness of the Flexor Muscles of the Thigh, and the breadth of the surrounding Ligaments.

The *Crural Foramen* is at the beginning of the Crural Sheath, and situated within it, and is commonly occupied by Absorbent Glands; or sometimes by the Trunks of the Absorbents themselves, coming from the Thigh; or now and then by a cross Stratum of Ligamentous Matter; in consequence of which, when the parts are prepared, there may be either a Foramen, or a Cribriform appearance, or an Impervious Septum in the Crural Ring. In this last case, the Absorbents are found to creep along the Coats of the Blood-vessels, in their course to the Abdomen.

Half way between the Spine of the Ilium and Symphysis Pubis, the Fascia Transversalis leaves an opening for the passage of the Spermatic Cord, or for the round Ligament of the Uterus; the beginning of which passage may be considered as the *Internal* or *Superior Abdominal Ring.*

The under part of this opening is formed by Poupart's Ligament, the upper by the Transverse and Internal Oblique Muscle.

From this opening there is no direct passage outwards, the part being shut by the Tendon of the Obliquus Externus.

The inner Ring is of the same form and size with the outer Ring, and is directed in the same manner with it.

Between the Internal and External Abdominal Rings, the passage is oblique, like the Rings themselves, and is about an inch in length. It has also a quantity of Cellular Substance, which is considered by some Authors as forming a distinct *Canal,* under the name of *Abdominal* or *Inguinal.* The Cellular Substance surrounds the Cord, or the round Ligament, and assists these in completely filling the whole of this passage.

RECTUS, vel *Pubio-sternalis,* vel *Sterno-pubialis.*

Origin: Tendinous from the fore and upper part of the Symphysis Pubis. It soon becomes Fleshy, and runs upwards in form of a flat Band, the whole length of, and parallel to, the Linea Alba. Between its upper Extremity and the Umbilicus, it is divided into three nearly equal portions, by as many transverse Tendinous Intersections, and there is generally a half Intersection some way below the Umbilicus. These seldom penetrate through the whole thickness of its Substance. They adhere firmly to the anterior part of the Sheath which incloses the Muscle, so as to render its separation difficult, but slightly to the posterior Layer.

Insertion: Into the Cartilages of the three inferior True Ribs, and extremity of the Sternum. It frequently intermixes with the under edge of the Pectoralis Major.

Action: To compress the fore part of the Abdomen; to draw down the Ribs in Expiration; and to bend the Body forwards, or to raise the Pelvis. By means of its Sheath and Tendinous Intersections, it is kept in its place, and allowed to act more equally.

PYRAMIDALIS, vel *Pubio-sub-umbilicalis.*

Origin: By a broad Base, from the Crest of the Os Pubis, and from the upper part of the Symphysis Pubis. It runs upwards within the same Sheath with the Rectus, tapering to a point in its ascent.

Insertion: Into the Linea Alba and inner edge of the Rectus, near half-way between the Pubis and Umbilicus.

Action: To assist the under part of the Rectus in drawing down the Ribs, or to compress the under part of the Abdomen.

It is frequently wanting in both sides, and then the under end of the Rectus is larger, thus in some measure supplying its place.

MUSCLES OF THE MALE PARTS OF GENERATION, AND OF THE ANUS.

Cremaster, vel *Musculus Testis vel Scroti.*

Origin: From the under edge of the Obliquus Internus Abdominis. Passing through the Ring of the Obliquus Externus, it surrounds the Spermatic Cord as far as the Testicle, where the Fibres separate and expand.

Insertion: Into the Tunica Vaginalis Testis, and Cellular Substance of the Scrotum.

Action: To contract the Scrotum, to suspend and elevate, and to compress and evacuate the Testicle.

ERECTOR PENIS,

Vel *Ischio-cavernosus*, vel *Ischio-sub-penialis.*

Origin: Tendinous from the inner side of the Tuberosity of the Os Ischium.—It runs upwards, Fleshy, increasing in breadth, and embracing the whole inner part of the Crus Penis.

Insertion: By a thin Tendon into the elastic Membrane which covers the Corpora Cavernosa Penis, as far as the union of the Crura.

Action: To compress the Crus Penis, by which means the Blood is pushed from it into the fore part of the Corpora Cavernosa, and the Penis thereby more completely distended. In the distension of the Penis, the Erector is assisted by the Levator Ani, Sphincter Ani, and Transversus Perinei.

ACCELERATOR URINÆ,

Vel *Ejaculator Seminis*, vel *Bulbo-urethralis.*

Origin: Fleshy from the Sphincter Ani, and Membranous part of the Urethra; and Tendinous from the Crus and beginning of the Corpus Cavernosum Penis. —In its course it forms a thin Fleshy Layer, the inferior Fibres of which run more transversely than the superior, which descend in an oblique direction; the Muscles on the opposite sides completely inclosing the Bulb of the Urethra.

Insertion: Into its fellow by a Tendinous line running longitudinally on the middle of the Bulb.

Action: To propel the Urine or Semen forwards, and by compressing the Bulb, to push the Blood into, and thereby distend, the Corpus Cavernosum Urethræ and Glans Penis.

TRANSVERSUS PERINEI,

Vel *Transversalis Urethræ*, vel *Ischio-perinealis*.

Origin: From the inside of the Tuberosity of the Os Ischium, close to the Erector Penis; running transversely, though sometimes in an oblique direction upwards.

Insertion: Into the back part of the Accelerator Urinæ, and adjoining part of the Sphincter Ani.

Action: To dilate the Bulb of the Urethra for the reception of the Semen or Urine; and to assist the Levator Ani in retracting the Anus, after the discharge of the Fæces.

There is frequently another Muscle, termed *Transversalis Perinei Alter*, running along with the former, and having nearly the same Origin, Insertion, and Action, but going more obliquely upwards.

SPHINCTER ANI.

Origin: By a Ligamentous Substance, from the extremity of the Os Coccygis; running forwards within the Skin and Fat which cover the verge of the Anus, and in its passage forming a broad, flat, oval Muscle, which surrounds the extremity of the Intestinum Rectum.

Insertion: By a narrow point, into the Acceleratores Urinæ and Transversi Perinei.

Action: To shut the Anus, and thereby retain the contents of the Rectum, and also to pull down the Bulb of the Urethra, by which it assists in ejecting the Urine and Semen. It is assisted by the *Sphincter Internus* of some Authors, which is merely the circular Muscular Coat of the end of the Rectum.

LEVATOR ANI, vel *Sub-pubio-coccygeus.*

Origin: By a semicircular Edge, from the Os Pubis, within the Pelvis, at the upper edge of the Foramen Thyroideum, the fore part coming off near the under end of the Synchondrosis; from the Aponeurosis which covers the Obturator Internus and Coccygeus; and from the Spinous Process of the Os Ischium. From these Origins it is continued down, occupying the under and inner portion of the Pelvis. Its Fibres descend like Radii from a circumference, to meet those of its fellow, and with it to form a kind of inverted Funnel.

Insertion: Into the Sphincter Ani, Accelerator Urinæ, and under and fore part of the Os Coccygis.—It surrounds the extremity of the Rectum, Neck of the Bladder, Membranous Portion of the Urethra, Prostate Gland, and part of the Vesiculæ Seminales.

Action: To support the contents of the Pelvis; to retract the end of the Rectum, after the evacuation of the Fæces; and to assist in the evacuation of the Rectum, Bladder, Vesiculæ Seminales, and Prostate Gland. —It is likewise considered by some as a principal agent in the distension of the Penis, by pressing upon its Veins.

Part of the Levator Ani, which arises from the Os Pubis, between the lower part of the Symphysis and the upper part of the Foramen Ovale, and assists in inclosing the Prostate Gland, is called by SOEMMERRING *Compressor Prostatæ.*

Between the Membranous part of the Urethra, and that portion of the Muscle which arises from the inner side of the Symphysis Pubis, there is a reddish Cellular, and very Vascular Substance, but apparently without any distinct Muscular Fibres, closely surrounding this Canal, which has been described by MR WILSON, in the Medico-Chirurgical Transactions of London for 1809, as a distinct *Compressor Urethræ.*

MUSCLES OF THE FEMALE PARTS OF GENERATION, AND OF THE ANUS.

ERECTOR CLITORIDIS, vel *Ischio-sub-clitorideus.*

Origin : As in the Erector Penis in the Male, but the Muscle smaller.

Insertion : Into the Crus and Body of the Clitoris.

Action : To draw the Clitoris downwards and backwards; and by pushing the Blood into it from its Crus, the Muscle may render the Body of the Clitoris more tense.

SPHINCTER VAGINÆ, vel *Perineo-clitorideus.*

Origin : From the Sphincter Ani, and, near the Perineum, from the posterior side of the Vagina. It passes along the outer end of the Vagina, covers the Corpus Cavernosum Vaginæ; going behind the Nymphæ.

Insertion : Into the union of the Crura Clitoridis.

Action : To contract the external Orifice of the Vagina, by compressing its Corpus Cavernosum, from which it likewise pushes the Blood into the Nymphæ and Clitoris.

TRANSVERSUS PERINEI.

Origin : As in the Male.

Insertion : Into the upper part of the Sphincter Ani, the adjacent parts of the Sphincter Vaginæ, and into a tough white Substance in the Perineum.

Action : Upon the Perineum and Anus, as in the Male.

When a Transversus Perinei Alter is present, it has the same relation to the former Muscle as in the Male.

SPHINCTER ANI.

Origin and course as in the Male.

Insertion : Into the Sphincter Vaginæ, and tough white Substance in the Perineum.

Action : To shut the Anus, and, by pulling down the Perineum, to assist in contracting the external Orifice of the Vagina.

LEVATOR ANI.

Origin: As in the Male. In its descent, it embraces the inferior parts of the Vagina, Urethra, and Rectum.

Insertion: Into the Perineum, Sphincter Ani, extremity of the Vagina, and Rectum.

Action: Upon the Bladder, Urethra, and Rectum, as in the Male.—It also assists in supporting and contracting the Vagina, and may, by pressing upon the Veins, contribute to the distension of the Cells of the Clitoris and Corpus Cavernosum Vaginæ.

MUSCLES OF THE OS COCCYGIS.

COCCYGEUS, vel *Ischio-coccygeus*.

Origin: By a narrow point, from the Spinous Process of the Os Ischium.—In its passage, it gradually expands, and covers the inside of the posterior Sacro-ischiatic Ligament.

Insertion: Into the whole length of the side of the Os Coccygis.

Action: To move the Os Coccygis forwards, by which it assists the Levator Ani in supporting or raising the end of the Rectum.

CURVATOR COCCYGIS, vel *Sacro-coccygeus.*

Origin: From the under and fore part of the Os Sacrum.

Insertion: Into the fore and under part of the Os Coccygis.

Action: To assist the Coccygeus in bending the Os Coccygis.

The Curvator Coccygis was formerly considered as part of the Coccygeus.

MUSCLES SITUATED WITHIN THE CAVITY OF THE ABDOMEN.

DIAPHRAGMA.

THE Diaphragm forms a Fleshy and Tendinous Partition, which separates the Cavity of the Abdomen from that of the Thorax, and is perforated by several Holes, for the passage of Vessels and Nerves which go into, or come out from the Abdomen. It is concave below, and convex above; the middle of it reaching as high within the Thorax as the fourth pair of Ribs. Above, it is covered by the Pleura, and below, by the Peritoneum; and is commonly divided into two portions, called Superior or Larger, and Inferior or Smaller Muscles of the Diaphragm.

SUPERIOR, or *Greater Muscle of the Diaphragm.*

Origin: By Fleshy Indentations, from the Cartilago Ensiformis, and from the Cartilages of the Seventh, and of all the inferior Ribs on both sides. From these different Origins, the Fibres run in a radiated manner.

Insertion: Into a Cordiform Tendon, placed in the middle of the Diaphragm, in which the Fibres of the opposite sides are interlaced.—Towards the right side, the Tendon is perforated by a triangular Hole for the passage of the Vena Cava Inferior; and to the upper convex part of it, the Pericardium and Mediastinum are connected.

INFERIOR, or LESSER MUSCLE, or *Appendix of the Diaphragm.*

Origin: By four pair of Heads, of which one Pair in the middle, commonly called its Long, or Tendinous *Crura*, is the longest. The long Crura arise from the fore part of the fourth Lumbar Vertebra, and adhere to the Bodies of all the Vertebræ of the Loins above this, by the intervention of the Ligamentum Commune Anterius covering these Bones. In their ascent, they leave an oval opening for the passage of the Aorta and Thoracic Duct. The other Heads arise from the third, and also from the second Lumbar Vertebra, and are placed farther out. From the different Heads the Muscular Fibres run upwards, and form, in the middle, two Fleshy Columns, or Crura, which decussate, and leave an opening for the passage of the Esophagus.

Insertion: By strong Fleshy Fibres, into the posterior Edge of the Cordiform, or middle Tendon.

Action of the Diaphragm: To enlarge the Cavity of the Thorax in Inspiration, by its Fleshy part contracting, and bringing its two sides down from a convex to a plain Surface; the Abdominal Muscles at the same time yielding, but the Tendinous part of the Diaphragm remaining nearly in the same situation. In Expiration, the Diaphragm is replaced, chiefly by the action of the Abdominal Muscles. It is the Antagonist of the Abdominal Muscles in Inspiration, but acts in concert with them in Dejection and in Vomiting; though, with respect to this last circumstance, the action begins in the Diaphragm.

QUADRATUS LUMBORUM, vel *Ilio-Costalis.*

Origin: Broad, Tendinous, and Fleshy, from the posterior half of the Spine of the Os Ilium, and from a Ligament extended between it and the Transverse Process of the last Lumbar Vertebra.

Insertion: Into the Transverse Processes of all the Lumbar Vertebræ; into the last Rib, near the Spine; and, by a small Tendon, into the side of the last Dorsal Vertebra.

Action: To move the Loins to one side, to pull down the last Rib in laborious expiration, and, when both act, to bend the Loins forwards.

PSOAS PARVUS, vel *Prelumbo-pubialis.*

Origin: Fleshy, from the side of the last Vertebra of the Back, and from that of one or two of the upper Vertebræ of the Loins. It sends off a slender Tendon, which runs down by the inner side of the Psoas Magnus, and an Aponeurosis which expands upon the neighbouring Muscles.

Insertion: Into the Linea Ilio-pectinea of the Pubis, at the joining of that Bone with the Ilium.

Action: To assist in bending the Spine upon the Pelvis, and, in particular positions, in raising the Pelvis.

This Muscle is frequently wanting.

PSOAS MAGNUS, vel *Prelumbo-trochantineus.*

Origin: From the side of the Bodies, and from the Transverse Processes of the last Dorsal, and of all the Lumbar Vertebræ, by an equal number of Fleshy Slips, which uniting, form a thick strong Muscle, that bounds the upper part of the side of the Pelvis; passing down over the Os Pubis, behind POUPART'S *Ligament.*

Insertion: Tendinous and Fleshy, into the Trochanter Minor, and part of the Body of the Os Femoris.

Action: To bend the Thigh, and turn it a little outwards, or, when the Inferior Extremity is fixed, to assist in bending the Body.

ILIACUS INTERNUS, vel *Ilio-trochantineus.*

Origin: Fleshy, from the Transverse Process of the last Lumbar Vertebra; from all the inner Edge of the Spine of the Os Ilium; from the Edge of that Bone, between its anterior-superior Spinous Process and the Acetabulum; from the most hollow part of the Os

Ilium, and also from the Aponeurosis termed *Iliac Fascia*, which covers the Muscle. It joins the Psoas Magnus, where it begins to become Tendinous on the Os Pubis.

Insertion: Along with the Psoas Magnus.

Action: To assist the Psoas in bending the Thigh.

MUSCLES SITUATED UPON THE ANTERIOR AND LATERAL PARTS OF THE THORAX.

PECTORALIS MAJOR, vel *Pectoralis*, vel *Sterno-Humeralis.*

Origin: From the Sternal half of the Clavicle: from the fore part of the Edge of almost the whole length of the upper and middle Bone of the Sternum, and here the Muscle is connected with its fellow; and from the Cartilages of the fifth and sixth Ribs, where it mixes with the Obliquus Externus. The Fibres from thence converge towards the Axilla, where they decussate, and send off a flat twisted Tendon.

Insertion: Into the Ridge at the outer Edge of the Groove for lodging the Tendon of the long Head of the Biceps.

Action: To draw the Arm downwards and forwards, or in a direction towards the Sternum.

Between the Portions of the Muscle arising from the Clavicle and Sternum, there is a slight separation, in consequence of which these Portions have been considered by some Authors as two distinct Muscles.

PECTORALIS MINOR,

Vel *Serratus Minor Anticus*, vel *Costo-coracoidalis.*

Origin : Tendinous and Fleshy, in a serrated manner from the third, fourth, and fifth Ribs, near their Cartilages. Passing obliquely outwards, it becomes gradually narrower.

Insertion : Tendinous, into the point of the Coracoid Process of the Scapula.

Action : To bring the Scapula downwards and forwards, or, in laborious Inspiration, to raise the Ribs.

SUBCLAVIUS, vel *Costo-clavicularis.*

Origin : Tendinous, from the Cartilage of the first Rib. It soon becomes Fleshy, and runs outwards, under the Clavicle, increasing in breadth.

Insertion : Into the under Surface of the Clavicle, from near its Head, extending outwards as far as the Coracoid Process of the Scapula.

Action : To pull the Clavicle, and with it the Scapula, downwards and forwards.

SERRATUS MAGNUS,

Vel *Serratus Major Anticus*, vel *Costo-scapularis.*

Origin : From the nine superior Ribs, by an equal number of Fleshy Digitations. It runs obliquely upwards and backwards upon the side of the Thorax, and between it and the Subscapularis.

Insertion: Fleshy, into the whole length of the Base of the Scapula, and in a manner folded round it, between the insertion of the Rhomboideus and the origin of the Subscapularis.

Action: To move the Scapula forwards or downwards, according to the direction of its different Digitations; and when the Scapula is forcibly raised, as in violent Inspiration, to assist in dilating the Thorax, by elevating the Ribs; or if the Scapula be much depressed, the Serratus may then become a Muscle of Expiration.

MUSCLES SITUATED BETWEEN THE RIBS, AND WITHIN THE THORAX.

INTERCOSTALES EXTERNI.

Origin: From the under Edge of each Rib, excepting the Twelfth. They run obliquely downwards and forwards from the Spine to the joining of the Ribs with their Cartilages, from which, to the Sternum, they are discontinued; that place being occupied by an Aponeurosis.

Insertion: Into the upper Edge of each Rib, immediately below that from which they take their respective Origins.

Portions of the Intercostales Externi, which arise from the Transverse Processes of the Vertebræ, and terminate in the Ribs immediately below, are termed by ALBINUS, *Levatores Costarum Breviores.*—Other portions, which arise in the same manner, but pass over one Rib, and terminate in the next below it, are named by the same Author, *Levatores Costarum Longiores.*

INTERCOSTALES INTERNI.

Origin: The same with that of the Externi; but they begin at the Sternum, and run downwards and backwards, decussating the former Muscles like the strokes of the letter X, and continuing as far as the Angles of the Ribs, from which to the Spine they are wanting.

Insertion: In the same manner as the Externi.

Portions of the Intercostales Interni, near the under part of the Thorax, which pass over one Rib, and terminate in the next below it, are called, by DOUGLAS, *Costarum Depressores Proprii* COWPERI.

Action of the Intercostales Interni, as well as of the Externi: To enlarge the Cavity of the Thorax, by elevating the Ribs in the time of Inspiration; and the obliquity of the one set, balancing that of the other, allows them to be raised more immediately upwards.

From the obliquity of their Fibres, they are found to possess a greater power in raising the Ribs, than Fibres going in a perpendicular direction.

The Intercostales Externi end near the Sternum, and the Interni near the Spine, to admit the ready motion of the Ribs; for, had the former been continued to the Sternum, and the latter to the Spine, the parts of these Muscles supposed to be thus fixed, would of course have become Antagonists to the rest.

The Portions called *Levatores* and *Depressores Costarum* assist in raising the Ribs, in the same manner as the rest of the Intercostales.

STERNO-COSTALIS, vel *Triangularis Sterni.*

Origin: From the Edges of the Cartilago Ensiformis, and lower half of the middle Bone of the Sternum, within the Thorax. It runs upwards and outwards, behind the Cartilages of the Ribs.

Insertion: Generally by three Angular Terminations into the Cartilages of the third, fourth, and fifth Ribs, and sometimes also by a fourth Termination into the corresponding part of the Cartilage of the second or sixth Rib, near the union of the Cartilaginous with the Osseous part of the Ribs.

Action: To depress the Ribs into which they are fixed, and, of course, to assist in contracting the Cavity of the Thorax during Expiration.

MUSCLES used in dilating the Thorax during INSPIRATION.—Diaphragma, Intercostales Externi et Interni. In violent Inspiration, the Serrati Postici Superiores, Pectorales Minores, Scaleni Antici, Medii, et Postici, and Serrati Magni, are also brought into action.

MUSCLES used in contracting the Thorax during EXPIRATION.—Obliqui Externi, Obliqui Interni, Transversales, Recti, et Pyramidales Abdominis, Sterno-Costales, Serrati Postici Inferiores. In Violent Expiration, the above are assisted by the Sacro-Lumbales, Longissimi Dorsi, and Quadrati Lumborum.

MUSCLES CONTIGUOUS TO THE ANTERIOR PART OF THE VERTEBRÆ OF THE NECK.

LONGUS COLLI, vel *Predorso-atloideus.*

Origin: Tendinous and Fleshy, from the side of the Bodies of the three superior Vertebræ of the Back, and from the Transverse Processes of the four inferior Vertebræ of the Neck.

Insertion: Into the fore part of the Bodies of all the Vertebræ of the Neck, by as many small Tendons, which are covered with Flesh.

Action: To bend the Neck forwards and to one side, or, when both Muscles act, to bend the Neck directly forwards.

RECTUS CAPITIS ANTERIOR MAJOR,

Vel *Rectus Anterior Longus*, vel *Trachelo-sub-occipitalis Major.*

Origin: From the fore part of the Transverse Processes of the third, fourth, fifth, and sixth Vertebræ of

the

the Neck. It runs upwards, and a little inwards, covering the outer edge of the Longus Colli.

Insertion: Into the Cuneiform Process of the Occipital Bone, near its joining with the Os Sphenoides.

Action: To bend the Head forwards.

RECTUS CAPITIS ANTERIOR MINOR,

Vel *Rectus Anterior Minor*, vel *Trachelo-sub-occipitalis Minor.*

Origin: From the fore part of the Atlas, opposite to its superior Oblique Process. It runs obliquely inwards behind, and a little to the outside of the former Muscle.

Insertion: Into the Cuneiform Process of the Occipital Bone, immediately before the Condyles.

Action: To assist the Rectus Major.

RECTUS CAPITIS LATERALIS, vel *Atloido-sub-occipitalis.*

Origin: From the anterior part of the Transverse Process of the Atlas.—It goes obliquely outwards.

Insertion: Into the Occipital Bone at the outside of the Condyle, and directly behind the Jugular Fossa.

Action: To incline the Head a little to one side.

MUSCLES SITUATED UPON THE POSTERIOR PART OF THE TRUNK.

TRAPEZIUS, vel *Cucullaris*, vel *Dorso-super-acromialis.*

Origin: From the middle of the great arched Ridge of the Occipital Bone; from its fellow over the Spinous Processes of the Cervical Vertebræ, by the intervention of a strong Tendon, called *Ligamentum Nuchæ* vel *Colli;* from the Spinous Processes of the two Inferior Vertebræ of the Neck, and from all those of the Back, adhering Tendinous to its fellow the whole length of its Origin.

Insertion: Fleshy, into the Scapulary half of the Clavicle: Tendinous and Fleshy, into the Acromion, and into the Spine of the Scapula.

Action: To move the Clavicle and Scapula, according to the directions of its different Fibres. The superior Fibres descending, raise the shoulder; the middle running transversely, pull it backwards; and the inferior Fibres ascending, depress it. The whole acting together, bring it immediately back.—When the Scapula is fixed, the Muscle assists in moving the Head backwards.

LATISSIMUS DORSI, vel *Lumbo-humeralis.*

Origin: By a broad Tendinous Expansion, from the posterior part of the Spine of the Os Ilium; from all the Spinous Processes of the Vertebræ extending between the under end of the Os Sacrum and sixth Dorsal Vertebra, and, by three or four Tendinous or Fleshy Slips, from an equal number of inferior Ribs. The Tendon by degrees changes into a muscle of great breadth, the inferior Fibres of which run upwards and outwards, and the superior transversely over the under Angle of the Scapula, receiving a small Slip from it in their way to the Axilla, where the Fibres of the Muscle in general are collected, twisted, and folded, like those of the Pectoralis Major.

Insertion: By a strong thin Tendon, into the inner Edge of the Groove for lodging the Tendon of the long Head of the Biceps.

Action: To pull the arm downwards and backwards, and to roll the Os Humeri inwards, by which the Palm of the Hand is made to face backwards. When the Pectoralis Major acts at the same time with this Muscle, the Arm is brought immediately down towards the Trunk.

The Latissimus Dorsi and Pectoralis Major form the Axilla, in which the great Vessels and Nerves, and likewise the Glands lie, which belong to the Arm.

Serratus Posticus Inferior, vel *Lumbo-costalis.*

Origin: By the same common Tendon with the Latissimus Dorsi, from the two inferior Dorsal, and from the three superior Lumbar Vertebræ.

Insertion: By four Fleshy Slips, into the same number of inferior Ribs, near their Cartilages.

Action: To depress the Ribs into which it is inserted, and thereby, during Expiration, to assist in contracting the Cavity of the Thorax.

RHOMBOIDEUS, vel *Dorso-scapularis.*

Origin: Tendinous, from the Spinous Processes of the four or five superior Dorsal, and of the three inferior Cervical Vertebræ, and from the Ligamentum Nuchæ; descending obliquely.

Insertion: Into the whole length of the Base of the Scapula.

Action: To draw the Scapula upwards and backwards.

This Muscle is frequently divided by an indistinct Line into two unequal Portions: The part arising from the Dorsal Vertebræ, and fixed to the Base of the Scapula under the Spine, is commonly called *Rhomboides Major*, and the other part of the Muscle, *Rhomboides Minor.*

SPLENIUS,

Vel *Cervico-mastoideus et Dorso-cervicalis.*

Origin: Tendinous, from the Spinous Processes of the four Superior Dorsal; and Tendinous and Fleshy, from those of the five inferior Cervical Vertebræ. It adheres firmly to the Ligamentum Nuchæ, and at the third Cervical Vertebra it recedes from its fellow, so that part of the Complexus is seen.

Insertion: By as many Tendons into the five superior Transverse Processes of the Cervical Vertebræ, and by a Tendinous and Fleshy Portion, into the posterior part of the Mastoid Process, and into the Os Occipitis, where it joins with that Process.

Action: To antagonize the Sterno-mastoideus, by bringing the Head, and upper Cervical Vertebræ, obliquely backwards and to one side. When the Splenii act together, they draw the Head directly backwards.

This Muscle is divided by Albinus into *Splenius Capitis*, or that which arises from the Neck, and goes to the Head; and *Splenius Colli*, or that which arises from the Back, and is fixed to the Neck.

Serratus Posticus Superior, vel *Dorso-costalis.*

Origin: By a broad thin Tendon, from the Ligamentum Nuchæ, over the Spinous Processes of the three last Cervical, and two uppermost Dorsal Vertebræ; going obliquely downwards.

Insertion: By four Fleshy Slips, into the second, third, fourth, and fifth Ribs, under the upper and back part of the Scapula.

Action: To elevate the Ribs, and thus to dilate the Thorax in violent Inspiration.

Sacro-Lumbalis, vel *Sacro-costalis.*

Origin: In common with the Longissimus Dorsi, Tendinous without, and Fleshy within, from the side and all the Spinous Processes of the Os Sacrum; from the posterior part of the Spine of the Os Ilium; and from all the Spinous and Transverse Processes of the Lumbar Vertebræ. The common Head fills up the space between the Os Ilium and Os Sacrum, and also the Hollow of the Loins. At the under part of the Thorax, the Muscle begins to send off Tendons, which are of considerable length, and lie flat upon the Ribs.

Insertion: Into the Angles of all the Ribs, by an equal number of Tendons.

From six or eight of the Lower Ribs arise an equal number of Fleshy Portions, which terminate in the inner side of this Muscle, and get the name of *Musculi Accessorii*, vel *Additamentum ad Sacro-lumbalem.*

Action: To assist in raising and keeping the Trunk of the Body erect. It also assists the Serratus Inferior, and Quadratus Lumborum, in depressing the Ribs during laborious Expiration.

From the upper part of this Muscle, a Fleshy Slip, called *Cervicalis Descendens*, runs up to be fixed to the Transverse Processes of the fourth, fifth, and sixth Cervical Vertebræ, by three distinct Tendons. It turns the Neck obliquely backwards and to one side.

LONGISSIMUS DORSI, vel *Sacro-spinalis.*

Origin: In common with the Sacro-lumbalis. It forms a large, thick, and strong Muscle, which fills the hollow between the Spine and Angles of the Ribs; becoming gradually smaller in its ascent.

Insertion: Into the Transverse Processes of all the Dorsal Vertebræ, chiefly by small double Tendons;

and, by a Tendinous and Fleshy Slip, into the lower Edge of each of the Ribs, excepting the two inferior, near their Tubercles.

Action: To extend the Trunk, and keep it erect; the outer part may assist in depressing the Ribs during laborious Expiration.

From the upper part of this Muscle, a round Fleshy Slip runs up to join the Cervicalis Descendens.

SPINALIS DORSI.

Origin: By five Tendinous Slips, from the Spinous Processes of the two upper Lumbar, and the three lower Dorsal Vertebræ. In its ascent, it is incorporated with the Longissimus Dorsi.

Insertion: Into the Spinous Processes of the eight or nine uppermost Dorsal Vertebræ, excepting the first, by as many Tendons.

Action: To fix the Vertebræ, and to assist in extending the Trunk, and in keeping it erect.

COMPLEXUS, vel *Trachelo-occipitalis.*

Origin: By distinct Tendons, from the Transverse Processes of the seven superior Dorsal, and four inferior Cervical Vertebræ, and, by a Fleshy Slip, from the Spinous Process of the first Dorsal Vertebra. In its passage upwards, it is intermixed with Tendinous and Fleshy parts.

Insertion: Into a Depression, under the middle of the large arched Ridge of the Occipital Bone.

Action: To draw the Head backwards, and to one side; and when both act, to draw the Head directly backwards.

The long Portion of the Muscle, which lies next the Spinous Processes, is more loose than the rest, and has a roundish Tendon in the middle of it, with a Fleshy Belly at each end, on which account it is called by ALBINUS, *Biventer Cervicis.*

TRACHELO-MASTOIDEUS,

Vel *Complexus Minor*, vel *Mastoideus Lateralis.*

Origin: From the Transverse Processes of the three uppermost Dorsal, and five lowest Cervical Vertebræ, where it is connected to the *Transversalis Cervicis*, by as many thin Tendons, which unite into a slender Belly, and run up under the Splenius.

Insertion: Into the posterior Margin of the Mastoid Process of the Temporal Bone, by a thin Tendon.

Action: To assist the Complexus; but pulling the Head more laterally.

LEVATOR SCAPULÆ,

Vel *Levator Proprius*, vel *Musculus Patientiæ*, vel *Trachelo-scapularis.*

Origin: From the Transverse Processes of the five superior Cervical Vertebræ, by the same number of distinct Heads, which soon unite to form a flat Muscle, running downwards and outwards.

Insertion: Into the superior Angle of the Scapula.

and, by a Tendinous and Fleshy Slip, into the lower Edge of each of the Ribs, excepting the two inferior, near their Tubercles.

Action: To extend the Trunk, and keep it erect; the outer part may assist in depressing the Ribs during laborious Expiration.

From the upper part of this Muscle, a round Fleshy Slip runs up to join the Cervicalis Descendens.

SPINALIS DORSI.

Origin: By five Tendinous Slips, from the Spinous Processes of the two upper Lumbar, and the three lower Dorsal Vertebræ. In its ascent, it is incorporated with the Longissimus Dorsi.

Insertion: Into the Spinous Processes of the eight or nine uppermost Dorsal Vertebræ, excepting the first, by as many Tendons.

Action: To fix the Vertebræ, and to assist in extending the Trunk, and in keeping it erect.

COMPLEXUS, vel *Trachelo-occipitalis.*

Origin: By distinct Tendons, from the Transverse Processes of the seven superior Dorsal, and four inferior Cervical Vertebræ, and, by a Fleshy Slip, from the Spinous Process of the first Dorsal Vertebra. In its passage upwards, it is intermixed with Tendinous and Fleshy parts.

Insertion: Into a Depression, under the middle of the large arched Ridge of the Occipital Bone.

Action: To draw the Head backwards, and to one side; and when both act, to draw the Head directly backwards.

The long Portion of the Muscle, which lies next the Spinous Processes, is more loose than the rest, and has a roundish Tendon in the middle of it, with a Fleshy Belly at each end, on which account it is called by ALBINUS, *Biventer Cervicis.*

TRACHELO-MASTOIDEUS,

Vel *Complexus Minor*, vel *Mastoideus Lateralis.*

Origin: From the Transverse Processes of the three uppermost Dorsal, and five lowest Cervical Vertebræ, where it is connected to the *Transversalis Cervicis*, by as many thin Tendons, which unite into a slender Belly, and run up under the Splenius.

Insertion: Into the posterior Margin of the Mastoid Process of the Temporal Bone, by a thin Tendon.

Action: To assist the Complexus; but pulling the Head more laterally.

LEVATOR SCAPULÆ,

Vel *Levator Proprius*, vel *Musculus Patientiæ*, vel *Trachelo-scapularis.*

Origin: From the Transverse Processes of the five superior Cervical Vertebræ, by the same number of distinct Heads, which soon unite to form a flat Muscle, running downwards and outwards.

Insertion: Into the superior Angle of the Scapula.

Action : To pull the Scapula upwards, and a little forwards, as in shrugging the Shoulder; and, when the Scapula is fixed, to pull the Neck a little to one side.

SEMI-SPINALIS DORSI, vel *Transverso-spinalis Dorsi.*

Origin : From the Transverse Processes of the seventh, eighth, ninth, and tenth Dorsal Vertebræ, by as many distinct Tendons, which soon grow Fleshy, and then again become Tendinous.

Insertion : Into the Spinous Processes of the six or seven uppermost Dorsal, and two lowest Cervical Vertebræ, by as many Tendons.

Action : To extend the Spine obliquely backwards.

MULTIFIDUS SPINÆ,

Formerly described as three distinct Muscles, viz. *Transverso-spinalis Lumborum*, *Transverso-spinalis Dorsi*, and *Transverso-spinalis Colli.*

Origin : From the side of the Spinous Processes of the Os Sacrum, and from that part of the Os Ilium which joins with the Sacrum; from all the Oblique and Transverse Processes of the Lumbar Vertebræ; from all the Transverse Processes of the Dorsal, and of the four inferior Cervical Vertebræ, by as many distinct Tendons, which soon become Fleshy, and run obliquely upwards and inwards.

Insertion : By distinct Tendons, into all the Spinous

Processes of the Lumbar, Dorsal, and Cervical Vertebræ, excepting the Atlas.

Action: To extend the Spine obliquely, and pull it to a side. When both Muscles act, they draw the Spine directly backwards.

SEMI-SPINALIS COLLI,

Vel *Transverso-spinalis Colli.*

Origin: From the Transverse Processes of the six uppermost Dorsal Vertebræ, by an equal number of distinct Tendons, which run obliquely under the Complexus.

Insertion: Into the Spinous Processes of all the Cervical Vertebræ, except the first and last.

Action: To extend the Neck obliquely backwards, and to a side.

TRANSVERSALIS COLLI.

Origin: From the Transverse Processes of the five uppermost Dorsal Vertebræ, by the same number of Tendinous and Fleshy Slips. It runs between the Trachelo-mastoideus, Splenius Colli, and Cervicalis Descendens.

Insertion: Into the Transverse Processes of all the Cervical Vertebræ, except the first and last.

Action: To turn the Neck obliquely backwards, and a little to one side.

RECTUS CAPITIS POSTICUS MINOR,

Vel *Rectus Minor*, vel *Atloido-occipitalis.*

Origin: Tendinous, close to its fellow, from a small Protuberance which is instead of the Spinous Process of the first Cervical Vertebra; spreading out in its ascent.

Insertion: Fleshy, into a Depression between the middle of the smaller Arch and Foramen Magnum of the Occipital Bone.

Action: To assist the following Muscle in drawing the Head backwards.

RECTUS CAPITIS POSTICUS MAJOR,

Vel *Rectus Major*, vel *Axoido-occipitalis.*

Origin: Fleshy, from the external part of the Spinous Process of the second Cervical Vertebra. It becomes gradually broader, and goes obliquely upwards and outwards.

Insertion: Tendinous and Fleshy, into the Os Occipitis, at the outside of the Insertion of the Rectus Minor, part of which it covers.

Action: To pull the Head backwards, and to assist a little in its rotation.

OBLIQUUS CAPITIS INFERIOR, vel *Axoido-atloideus.*

Origin: Fleshy, from the Spinous Process of the second Cervical Vertebra, at the outside of the Rectus

Major. It forms a thick Belly, which runs upwards and outwards.

Insertion: Into the Transverse Process of the first Cervical Vertebra.

Action: To roll the Head.

OBLIQUUS CAPITIS SUPERIOR,

Vel *Atloido-sub-mastoideus.*

Origin: From the Transverse Process of the first Cervical Vertebra, passing upwards and a little inwards.

Insertion: Into the Occipital Bone, at the outer part of the Insertion of the Rectus Major.

Action: To assist in drawing the Head backwards, and a little to one side.

SCALENUS ANTICUS, vel *Costo-cervicalis Anticus.*

Origin: Tendinous and Fleshy, from the upper part of the first Rib, near its Cartilage.

Insertion: Into the Transverse Processes of the fourth, fifth, and sixth Cervical Vertebræ, by as many Tendons.

SCALENUS MEDIUS, vel *Costo-cervicalis Medius.*

Origin: From the upper and outer part of the first Rib, from its Root to near its Cartilage.

Insertion: Into the Transverse Processes of all the Cervical Vertebræ, by as many strong Tendons.

The Subclavian Artery, and the Nerves which form the Brachial Plexus, pass between this and the former Muscle.

SCALENUS POSTICUS, vel *Costo-cervicalis Posticus.*

Origin: From the upper edge of the second Rib, near the Spine.

Insertion: Into the Transverse Processes of the fifth and sixth Cervical Vertebræ.

Action of the three Scaleni: To bend the Neck to one side; or, when the Neck is fixed, to raise the Ribs, and dilate the Thorax, as in violent Inspiration.

INTERSPINALES COLLI.

The spaces between the Spinous Processes of the Cervical Vertebræ, most of which are forked, are occupied by double Fleshy Portions.

Origin: From the upper part of each Spinous Process.

Insertion: Into the under part of each Spinous Process, immediately above that from which it takes its Origin.

Action: To draw these Processes nearer to each other, and of course the Neck a little backwards.

INTERTRANSVERSALES COLLI.

The spaces between all the Transverse Processes of the Cervical Vertebræ, which are also forked, are filled up in like manner with double Fleshy Portions.

Action: To draw these Processes towards each other, and turn the Neck a little to one side.

INTERSPINALES ET INTERTRANSVERSALES DORSI.

These are rather small Tendons than Muscles, serving to connect the Spinous and Transverse Processes.

INTERSPINALES LUMBORUM.

They are of the same nature with the Interspinales and Intertransversales Dorsi.

INTERTRANSVERSALES LUMBORUM.

These are five distinct Muscles, which occupy the Spaces between the Transverse Processes of the last Dorsal and of all the Lumbar Vertebræ, and serve to draw them a little towards each other.

MOTIONS *of the* HEAD *and* TRUNK.

The HEAD is moved upon the Atlas,—*forwards*, by the Recti Capitis Anteriores Minores, and Recti Capitis Laterales;—*backwards*, by the Recti Capitis Postici Minores, and Obliqui Capitis Superiores;—*laterally*, by the Anterior and Posterior Muscles of the corresponding side.

The HEAD and NECK are moved together,—*forwards*,

wards, partly through the medium of the Lower Jaw, by the Platysmæ Myoides, Digastrici, Mylo-hyoidei, Genio-hyoidei, Genio-hyo-glossi;—*directly forwards*, by the Sterno-mastoidei, Recti Capitis Anteriores Majores;—*forwards*, through the medium of the Larynx, by the Omo-hyoidei, Sterno-hyoidei, Sterno-thyroidei, and Thyro-hyoidei:—*backwards*, by the upper portion of the Trapezii, the Splenii Capitis, Complexi, Recti Capitis Postici Majores, and Trachelo-mastoidei;—*laterally*, by the Opponent, or Anterior and Posterior Muscles of the corresponding side acting together. By a succession of these motions, the Head is enabled to describe a Circle.

The ROTATION of the HEAD, or of the Atlas, upon the Vertebra Dentata, is performed by the following Muscles, acting exclusively of their fellows; viz. on one side, the Sterno-mastoideus, and upper portion of the Trapezius, and on the other side, and acting at the same time with these two Muscles, the Platysma Myoides, upper part of the Splenius, the Trachelo-mastoideus, Complexus, Obliquus Inferior, and Rectus Major.

The NECK, from the Vertebra Dentata downwards, is moved—*forwards*, by the Longi Colli;—*backwards*, by the Rhomboidei Minores, Serrati Postici Superiores, Splenii Colli, Cervicales Descendentes, Transversales, Semi-spinales et Interspinales Colli, and upper part of the Multifidi Spinæ;—*laterally*, by the Muscles upon the anterior and posterior parts of the Neck acting on one side, and these assisted by the following, which are chiefly situated upon the lateral parts of the Neck, viz.

the Levator Scapulæ, Scaleni Anticus, Medius, et Posticus, and Intertransversales Colli.

The TRUNK is moved, and chiefly at the Loins,—*forwards*, by the Psoæ Magni et Parvi, Quadrati Lumborum, Récti, Pyramidales, Obliqui Externi, Obliqui Interni, et Transversales Abdominis;—*backwards*, by the Sacro-lumbales, Longissimi, Spinales et Semi-spinales Dorsi, Multifidi Spinæ, Interspinales Lumborum; —*laterally*, by the Muscles mentioned above, upon the anterior and posterior parts of the Trunk acting upon one side, and these assisted by the Quadratus et Intertransversales Lumborum;—*twisted*, by the Obliquus Externus Abdominis, Serratus Posticus Inferior, Semispinalis Dorsi, Multifidus Spinæ, Dorsi, et Lumborum, on one side, assisted by the Obliquus Internus Abdominis, Sacro-lumbalis, and Longissimus Dorsi of the other side;—*kept erect*, by the Muscles upon the fore and back parts of the Trunk, acting as antagonists to each other.

By making the Head, or the upper part of the Trunk, the fixed point, the same motions may be performed, and by the same Muscles, as when the Pelvis is fixed, or when the lower parts of the Trunk is in its natural situation; but the Muscles draw the moveable parts in direct opposition to those formerly moveable; and the Muscles which in the natural situation rolled the Head, with the Atlas, on the Vertebra Dentata, or twisted the other parts of the Spine, act now also in a contrary direction. The same circumstances hold good with respect to the Extremities.

MUSCLES

OF

THE SUPERIOR EXTREMITY.

PECTORALIS Major, *see* p. 238.—Pectoralis Minor, *see* p. 239.—Subclavius, *see* p. 239.—Serratus Magnus, *see* p. 239.—Trapezius, *see* p. 245.—Latissimus Dorsi, *see* p. 245.—Rhomboideus, *see* p. 247.—Levator Scapulæ, *see* p. 251.

MOTIONS OF THE SCAPULA.

The Scapula is moved—*upwards*, by the Trapezius, Levator Scapulæ, Rhomboideus, and Omo-hyoideus;—*downwards*, by the Trapezius, Serratus Magnus, Pectoralis Minor, Subclavius, and occasionally, through the medium of the Humerus, by the Latissimus Dorsi, and Pectoralis Major;—*forwards* and *downwards*, by the Serratus Magnus, Pectoralis Minor, Subclavius, and occasionally by the Pectoralis Major;—*backwards*, by the Trapezius, Rhomboideus, and occasionally the Latissimus Dorsi;—*moved obliquely* upwards or downwards, by the above Muscles, according to their different situations.—By a succession of these motions, the Scapula is *rolled*, as in a Circle, upon the Thorax, through the medium of the Clavicle;—or it can roll in a manner upon an *axis* put through its middle, its upper end going forwards and downwards, chiefly by means of the Pectoralis Minor, the under end at the same time moving upwards and backwards, principally by the Rhomboideus Major; or the reverse of this motion is produced by the upper part of the Trapezius and the under portion of the Serratus Magnus acting together.

MUSCLES ARISING FROM THE SCAPULA.

SUPRA-SPINATUS,

Vel *Super-scapulo-trochitereus Parvus.*

Origin: Fleshy, from the whole Fossa Supra-spinata, and from the Spine and Superior Costa of the Scapula; passing under the Acromion, and adhering to the Capsular Ligament of the Joint.

Insertion: Tendinous, into the fore part of the large Tubercle on the Head of the Os Humeri.

Action: To raise the Arm, and at the same time to pull the Capsular Ligament from between the Bones, so as to prevent it from being pinched.

INFRA-SPINATUS,

Vel *Super-scapulo-trochitereus Magnus.*

Origin: Fleshy, from all that part of the Dorsum Scapulæ which is below its Spine; and from the Spine itself, as far as the Cervix Scapulæ. The Fibres run obliquely towards a Tendon in the middle of the Muscle, which goes forwards, and adheres to the Capsular Ligament.

Insertion: By a flat thick Tendon, into the upper and outer part of the large Protuberance on the Head of the Os Humeri.

Action: To roll the Os Humeri outwards; to assist in raising, and in supporting it when raised; and to pull the Ligament from between the Bones.

These two Muscles are covered by an Aponeurosis, which extends between the Costæ and edges of the Spine of the Scapula, and gives rise to many of the Muscular Fibres.

TERES MINOR,

Vel *Super-scapulo-trochitereus Minimus.*

Origin: Fleshy, from the inferior Costa of the Scapula. It ascends along the under edge of the Infra-spinatus, and adheres to the Capsular Ligament.

Insertion: Tendinous, into the back part of the large Protuberance on the Head of the Os Humeri, a little below the Infra-spinatus.

Action: To roll the Os Humeri outwards, to draw it backwards, and to prevent the Ligament from being pinched between the Bones.

TERES MAJOR, vel *Scapulo-humeralis.*

Origin: Fleshy, from the Dorsal side of the inferior Angle of the Scapula, and from a small part of its inferior Costa. It is situated at the under part of the Teres Minor, and sends off a broad flat Tendon, which accompanies that of the Latissimus Dorsi.

Insertion: Along with the Latissimus Dorsi, into the Ridge at the inner side of the Groove for lodging the Tendon of the Long Head of the Biceps.

Action: To roll the Humerus inwards, and to draw it backwards and downwards.

DELTOIDES, vel *Sub-acromio-humeralis.*

Origin: Fleshy, from all the outer part of the Clavicle unoccupied by the Pectoralis Major, from which it is separated by a small Fissure; Tendinous and Fleshy, from the Acromion, and lower Margin of almost the whole Spine of the Scapula, opposite to the insertion of the Trapezius.

From these origins it runs under the appearance of three Muscles going in different directions, and separated from each other by slight Fissures; viz. from the Clavicle outwards, from the Acromion downwards, and from the Spine of the Scapula forwards; and is composed of a number of Fasciculi, forming a strong

Fleshy Muscle, which covers the joint of the Os Humeri.

Insertion: Below that of the Pectoralis Major, by a short and strong Tendon, into a rough Surface, on the outer side of the Os Humeri, near its middle, where the Fibres of this Muscle intermix with part of the Brachialis Externus.

Action: To pull the Arm directly outwards and upwards, and a little forwards or backwards, according to the different directions of its Fibres.

CORACO-BRACHIALIS, vel *Coraco-humeralis.*

Origin: Tendinous and Fleshy, from the fore part of the Coracoid Process of the Scapula, in common with the short Head of the Biceps, to which it adheres through the greater part of its length.

Insertion: Tendinous and Fleshy, into the internal part of the Os Humeri, near its middle, where it sends down an Aponeurosis to the internal Condyle of that Bone.

Action: To bring the Arm obliquely upwards and forwards.

SUBSCAPULARIS, vel *Sub-scapulo-trochineus.*

Origin: Fleshy, from the three Costæ and whole inner Surface of the Scapula. It is composed of a number of Tendinous and Fleshy portions, which run in a radiated manner, and make prints on the Bone;

in its passage outwards, adhering to the Capsular Ligament.

Insertion: Tendinous, into the upper part of the internal Protuberance at the Head of the Os Humeri.

Action: To roll the Arm inwards, to draw it to the side of the Body, and to prevent the Capsular Ligament from being pinched.

The Humerus is *raised* by the Deltoides, Supra-Spinatus, Coraco-Brachialis, Biceps Flexor Cubiti;—and these assisted by the Infra-Spinatus, Subscapularis, and upper portion of the Pectoralis Major, in elevating the Arm to its utmost extent;—*depressed*, by the Pectoralis Major, Latissimus Dorsi, and Teres Major acting together, and assisted by the under portion of the Subscapularis, anterior and posterior parts of the Deltoides, Teres Minor, and Long Heads of the Triceps Extensor Cubiti;—drawn *forwards*, by the Pectoralis Major, anterior Portion of the Deltoides, Coraco-Brachialis, and Biceps Flexor Cubiti;—pulled *backwards*, by the Latissimus Dorsi, Teretes Major et Minor, posterior Portion of the Deltoides, and long Head of the Triceps Extensor Cubiti;—by a succession of these motions, the Elbow is made to move in a circle;—*rolled* round its axis *inwards* by the Subscapularis, anterior Portion of the Deltoides, Latissimus Dorsi, Teres Major, and occasionally by the Pectoralis Major;—*rolled outwards* by the Infra-Spinatus, Teres Minor, posterior Portion of the Deltoides, and occasionally by the Coraco-Brachialis.

MUSCLES chiefly situated on the ARM, serving for the MOTION of the FORE-ARM.

Aponeurosis of the Superior Extremity.

The greater part of the Superior Extremity is covered by a Tendinous Membrane or Aponeurosis, which arises from the different Processes of the Bones of, and the Muscles on, the Shoulder.

It covers the two Spinati Muscles on the back part of the Scapula, as already mentioned.

On the Humerus, it incloses the Flexor and Extensor Muscles of the Fore-arm, and is connected to the Ridges and Condyles at the under end of the Os Humeri.

At the bending of the Elbow, it is attached to the ends of the Radius and Ulna, and receives considerable additions from the Tendons of the Biceps and Triceps of the Fore-arm, where the Fibres from the opposite sides decussate each other.

It becomes thicker and stronger on the Fore-arm, and forms a firm covering to the Muscles there.

In its descent, it gives origin to many Muscular Fibres, and sends off among the Muscles, partitions which are fixed to the Radius and Ulna. The Membrane is at length lost insensibly upon the Hand.

It is thicker and stronger on the back than upon the fore side of the Extremity, particularly on the Fore-arm, at the under and back part of which it forms a thick and strong Band, that, running transversely, gets the name of *Ligamentum Carpi Annulare Posterius.*

The use of this Aponeurosis, like that in other parts of the Body, is to form a kind of Bandage to brace the Muscles, and keep them in their proper place while in action, and to give Origin to many of the Muscular Fibres which lie immediately under it.

BICEPS FLEXOR CUBITI,

Vel *Biceps*, vel *Scapulo-radialis.*

Origin: By two Heads: The outer one, called its *Long Head*, begins by a slender Tendon from the upper edge of the Glenoid Cavity of the Scapula, passes over the Ball of the Os Humeri within the Joint, and, in its descent without the Joint, is inclosed in a Groove upon the upper and fore part of the Bone, by a Ligament which proceeds from the Capsular one and adjacent Tendons: The inner one, called its *Short Head*, arises, Tendinous and Fleshy, from the Coracoid Process of the Scapula, in common with the Coraco-brachialis. A little below the middle of the fore part of the Os Humeri, the two Heads unite, and form a thick Fleshy Belly.

Insertion: By a strong roundish Tendon, into the Tubercle at the upper and inner part of the Radius, and by a Tendinous Expansion, into the Aponeurosis of the Fore-arm, which it likewise assists in forming.

Action: To bend the Fore-arm, and to assist the Supinator Muscles in rolling the Radius outwards, and, of course, to turn the Palm of the Hand upwards. It also assists in stretching the Aponeurosis.

Sometimes this Muscle has a third Head, which it derives from the Os Humeri.

Brachialis Internus, vel *Humero-Cubitalis.*

Origin: Fleshy, from the middle of the Os Humeri, at each side of the insertion of the Deltoides, covering all, and attached to most, of the under and fore part of the Bone. It runs over the Joint, adhering firmly to the Capsular Ligament.

Insertion: By a strong short Tendon, into the Coronoïd Process of the Ulna.

Action: To bend the Fore-arm, and to prevent the Ligament of the Joint from being pinched.

Triceps Extensor Cubiti,

Vel *Scapulo-humero-olecraneus.*

Origin: By three Heads: The first, or *long* Head, broad and Tendinous, from the Inferior Costa of the Scapula, near its Cervix: The second, or *short* Head, acute, Tendinous, and Fleshy, from the outer and back part of the Os Humeri, a little below its upper extremity: The third, formerly called *Brachialis Externus,* arises by an acute beginning, from the inner and back part of the Os Humeri, near the insertion of the Teres Major. The three Heads unite about the middle of the Humerus, and cover the whole posterior part of that Bone, adhering to it in their descent.

Insertion: Into the upper and outer part of the Olecranon of the Ulna, and partly into the Condyles of the Os Humeri, adhering closely to the Ligament.

Action: To extend the Fore-arm.

Anconeus, vel *Epicondilo-cubitalis.*

Origin: Tendinous, from the posterior part of the external Condyle of the Os Humeri. It descends under a triangular form, soon becomes Fleshy, and part of its Flesh is likewise continued from the third Head of the Triceps.

Insertion: Fleshy and thin, into a Ridge on the outer and back part of the Ulna, a little below the Olecranon.

Action: To assist the Triceps in extending the Fore-arm.

MUSCLES ON THE FORE-ARM AND HAND, SERVING FOR THE MOTION OF THE HAND AND FINGERS.

To prevent confusion in the application of the terms *Outer* and *Inner*, when the Muscles are described in the prone state of the Hand,—the Arm is here supposed to be placed by the side of the Body, with the Hand in a state of supination; so that the Radius and Thumb are upon the outer, and the Ulna and little Finger upon the inner side.

PALMARIS LONGUS, vel *Epitrochlo-palmaris.*

Origin : Tendinous, from the internal Condyle of the Os Humeri; soon becoming fleshy, and sending off a long slender Tendon.

Insertion : Into the Ligamentum Carpi Annulare Anterius, and into the Aponeurosis Palmaris.

Action : To stretch the Aponeurosis Palmaris, and assist in bending the Hand.

This Muscle is frequently wanting, but the Aponeurosis is always to be found.

APONEUROSIS PALMARIS.

This Tendinous Expansion is situated directly under the Integuments of the Palm of the Hand. It begins at the Ligamentum Carpi Annulare Anterius; and, after spreading out and covering the greater part of the Palm, is fixed to the Roots of all the Fingers by an equal number of double Slips.

It binds down and braces the Muscles in the Palm, and protects the Blood-vessels and Nerves in their course to the Fingers.

PALMARIS BREVIS, vel *Palmaro-cutaneus.*

Origin : By small Bundles of Fleshy Fibres, from the Ligamentum Carpi Annulare Anterius, and Aponeurosis Palmaris; and passing across, it has its

Insertion into the Skin and Fat which cover the Abductor Minimi Digiti, and into the Os Pisiforme.

Action: To assist in contracting the Palm of the Hand.

FLEXOR CARPI RADIALIS,

Vel *Radialis Internus*, vel *Epitrochlo-metacarpeus.*

Origin: Tendinous and Fleshy, from the inner Condyle of the Os Humeri, and from the fore and upper part of the Ulna, between the Pronator Radii Teres and Flexor Sublimis, to which it firmly adheres. It forms a long Tendon, which passes down near the Radius, goes through a Fossa in the Os Trapezium, and becomes flat at its inferior extremity.

Insertion: Into the fore and upper part of the Metacarpal Bone which sustains the Fore-Finger.

Action: To bend the Wrist, and to assist in the pronation of the Hand.

FLEXOR CARPI ULNARIS,

Vel *Ulnaris Internus*, vel *Cubito-carpeus.*

Origin: Tendinous, from the Internal Condyle of the Os Humeri; and, by a small Fleshy beginning, from the corresponding side of the Olecranon. It passes along the inner side of the Ulna, from which also it derives part of its origin for a considerable way down. A number of its Fleshy Fibres likewise arise from the Aponeurosis of the Fore-arm.

Insertion : By a strong Tendon, into the Os Pisiforme, which serves as a Pulley to the Muscle.

Action : To assist the former Muscle in bending the Wrist.

EXTENSOR CARPI RADIALIS LONGIOR,

Vel *Radialis Externus Longior*, vel *Humero-supermetacarpeus.*

Origin : Broad, thin, and Fleshy, directly below the Supinator Longus, from the lower part of the Ridge of the Os Humeri, above its external Condyle. It sends off a long flat Tendon, which passes down, first upon the outer, and then upon the back part of the Radius, descending in a Groove there, and going under the Ligamentum Carpi Annulare Posterius.

Insertion Into the upper, back, and outer part of the Metacarpal Bone of the Fore-Finger.

Action : To extend the Wrist, and bring the Hand backwards.

EXTENSOR CARPI RADIALIS BREVIOR,

Vel *Radialis Externus Brevior*, vel *Epicondilo-supermetacarpeus.*

Origin : Tendinous, in common with the Extensor Longior, but farther down; from the external Condyle of the Os Humeri, and from the Ligament which connects the Radius to it.—Passing down upon the back part of the Radius, its Tendon goes under the Ligamentum Annulare Posterius, in the same channel with the Tendon of the Extensor Longior.

Insertion : Into the upper and back part of the Metacarpal Bone of the Middle Finger.

Action : To assist the former Muscle in extending the Wrist; or with it and the Flexor Carpi Radialis, to draw the Hand to the side next the Thumb.

Extensor Carpi Ulnaris,

Vel *Ulnaris Externus*, vel *Cubito-super-metacarpeus.*

Origin : Tendinous, from the external Condyle of the Os Humeri; and in its progress Fleshy, from the middle of the Ulna, where it passes over that Bone. Its round Tendon is inclosed by a Membranous Sheath, in a Groove at the back part of the extremity of the Ulna.

Insertion : Into the posterior and upper part of the Metacarpal Bone of the Little Finger.

Action : To assist the two former Muscles in extending the Wrist; or, with the assistance of the Flexor Ulnaris, to draw the Hand towards the side next the Little Finger.

Flexor Digitorum Sublimis, vel Perforatus,

Vel *Epitrochlo-phalangeus Communis.*

Origin : Tendinous and Fleshy, from the internal Condyle of the Os Humeri; Tendinous, from the Root of the Coronoid Process of the Ulna; and Membranous and Fleshy, from the middle of the fore part of the Radius. Its Fleshy Belly sends off four round Tendons before it passes under the Ligamentum Carpi Annulare Anterius. In their course, they are connected to those of the following Muscle by fine Membranous Webs, and upon the Fingers are inclosed in strong Tendinous Sheaths.

Insertion: Into the anterior and upper part of the second Phalanx of the Fingers, being, near the under part of the first Phalanx, split and twisted to form a passage, and at the same time a kind of Sheath, for the Tendons of the Flexor Profundus.

Action: to bend the second, and then the first Phalanx of the Fingers.

FLEXOR DIGITORUM PROFUNDUS, vel PERFORANS,
Vel *Cubito-phalangeus Communis.*

Origin: Fleshy, from the external side and upper part of the Ulna, for some way down; and from a large share of the Interosseous Ligament. It descends behind the Flexor Sublimis, and, like it, splits into four Tendons, a little before it passes under the Ligamentum Annulare, and these go through the Slits in the Tendons of the Flexor Sublimis.

Insertion: Into the anterior and upper part of the third Phalanx of the Fingers.

Action: To bend the last Joint of the Fingers, and with the assistance of the former Muscles, to make the Fingers approach each other.

LUMBRICALES, vel *Palmo-phalangei.*

These consist of four small Muscles somewhat resembling Earth-worms, from which they derive their name.

Origin: Thin and Fleshy, from the outside of the Tendons of the Flexor Profundus, a little above the lower edge of the Ligamentum Carpi Annulare. At the under ends of the Metacarpal Bones, each sends off a slender Tendon.

Insertion: Into the outer sides of the broad Tendons of the Interossei Muscles, about the middle of the first Phalanx.

Action: To bend the first Phalanx, and increase the Flexion of the Fingers, while the long Flexors are in full action, and to assist the Radial Interossei in drawing the Fingers outwards.

EXTENSOR DIGITORUM COMMUNIS,

Vel *Epicondilo-super-phalangeus Communis.*

Origin: Tendinous and Fleshy, from the external Condyle of the Os Humeri, where it adheres to the Supinator Radii Brevis. It passes down upon the back part of the Fore-arm, and before it goes under the Ligamentum Carpi Annulare Posterius, it splits into three or four Tendons, some of which may be subdivided. Upon the back of the Metacarpal Bones, the Tendons become broad and flat, and, near the Heads of these Bones, send Aponeurotic Expansions to each other.

Insertion: Into the posterior part of all the Bones of the four Fingers, by a Tendinous Expansion, which is thick and strong at the sides of the Joints, but thin at their back part to facilitate their motions.

Action: To extend all the Joints of the Fingers, and to assist in making them diverge from each other.

A Slip of this Muscle going to the Little Finger, is called by some Authors *Extensor Proprius Minimi Digiti.*

Supinator Radii Longus, vel *Humero-super-radialis.*

Origin: By an acute Fleshy beginning, from the Ridge of the Os Humeri, above the external Condyle, nearly as high as the middle of the Bone. It forms a thick Fleshy Belly, which covers the upper part of the Extensor Carpi Radialis Longior; and about the middle of the Fore-arm sends a tapering Tendon along the edge of the Radius.

Insertion: Into the outer side of the under end of the Radius.

Action: To roll the Radius outwards, and, of course, to turn the Palm forwards.

Supinator Radii Brevis, vel *Epicondilo-radialis.*

Origin: Tendinous from the external Condyle of the Os Humeri, and Tendinous and Fleshy from the outer and upper part of the Ulna, and from the Interosseous Ligament. It passes over the external edge of the Radius.

Insertion: Into the upper and back part of the Radius.

Action: To assist the Supinator Longus.

PRONATOR RADII TERES, vel *Epitrochlo-radialis.*

Origin: Fleshy from the internal Condyle of the Os Humeri, and Tendinous from the Coronoid Process of the Ulna. It goes obliquely across the upper end of the Flexor Muscles of the Wrist, and is of a tapering form.

Insertion: Thin, Tendinous, and Fleshy, into the middle of the posterior part of the Radius.

Action: To roll the Radius inwards, by which it turns the Palm of the Hand backwards.

PRONATOR RADII QUADRATUS, vel *Cubito-radialis.*

Origin: Broad, Tendinous, and Fleshy, from the under and inner part of the Ulna. The Fibres running transversely, the Muscle has its

Insertion into the under and fore part of the Radius.

Action: To assist the Pronator Teres.

FLEXOR LONGUS POLLICIS MANUS,

Vel *Flexor Tertii Internodii*, vel *Radio-phalangeus Pollicis.*

Origin: By an acute, Fleshy beginning, from the fore part of the Radius and Interosseous Ligament, the

Origin extending from the Tubercle of the Bone, as far as the Pronator Quadratus. It has frequently another Origin, by a distinct Fleshy Slip, from the internal Condyle of the Os Humeri.

Insertion: Into the last Joint of the Thumb, after its Tendon has passed under the Ligamentum Carpi Annulare Anterius.

Action: To bend the last Joint of the Thumb.

Flexor Brevis Pollicis,

Vel *Flexor Secundi Internodii*, vel *Carpo-phalangeus Pollicis.*

Origin: From the Ossa Trapezoides, Magnum, et Unciforme. It is divided into two Portions, which form a Groove for the Tendon of the Flexor Longus Pollicis.

Insertion: Into the Ossa Sesamoidea, and base of the first Bone of the Thumb.

Action: To bend the first Joint of the Thumb.

Opponens Pollicis,

Vel *Flexor Ossis Metacarpi Pollicis*, vel *Flexor Primi Internodii*, vel *Carpo-Metacarpeus Pollicis.*

Origin: Fleshy, from the Os Trapezium and Ligamentum Carpi Annulare Anterius. It lies immediately under the Abductor Pollicis.

Insertion: Tendinous and Fleshy, into the under and fore part of the Metacarpal Bone of the Thumb.

Action: To bring the Thumb inwards, so as to make it oppose the Fingers; from which circumstance it has derived its name.

Extensor Ossis Metacarpi Pollicis,

Vel *Cubito-super-metacarpeus Pollicis.*

Origin: Fleshy, from the middle of the posterior parts of the Ulna, Radius, and Interosseous Ligament. It runs obliquely over the Radius, sending one, or more frequently two Tendons, through an Annular Sheath.

Insertion: Into the Os Trapezium, and upper and back part of the Metacarpal Bone of the Thumb.

Action: To extend the Metacarpal Bone of the Thumb, and draw it from the Fingers.

Extensor Primi Internodii Pollicis,

Vel *Extensor Minor*, vel *Cubito-super-phalangeus Primus Pollicis.*

Origin: Fleshy, from the back part of the Ulna, and from the Interosseous Ligament, near the former Muscle, by the side of which it runs.

Insertion: Tendinous, into the posterior part of the first Bone of the Thumb. A portion of it may be traced as far as the second Bone.

Action: To extend the first Joint of the Thumb.

EXTENSOR SECUNDI INTERNODII,

Vel *Extensor Major*, vel *Cubito-super-phalangeus Secundus Pollicis.*

Origin: By an acute, Tendinous, and Fleshy beginning, from the middle of the back part of the Ulna, and from the Interosseous Ligament. Its Tendon runs through a small Groove at the under, inner, and back part of the Radius.

Insertion: Into the last Bone of the Thumb.

Action: To extend the last Joint of the Thumb.

ABDUCTOR POLLICIS,

Vel *Carpo-super-phalangeus Pollicis.*

Origin: Broad, Tendinous, and Fleshy, from the Ligamentum Carpi Annulare, and from the Os Trapezium. It lies immediately under the Skin, and over the Opponens Pollicis.

Insertion: Tendinous, into the outer side of the root of the first Bone of the Thumb.

Action: To draw the Thumb from the Fingers.

A particular portion on the inner side of this Muscle is called by ALBINUS, *Abductor Brevis Alter.*

ADDUCTOR POLLICIS, vel *Metacarpo-Phalangeus Pollicis.*

Origin: Fleshy, from almost the whole length of the

Metacarpal Bone of the Middle Finger; going across the Metacarpal Bone of the Fore Finger, its Fibres converge, and send off a short Tendon.

Insertion: Into the inner part of the root of the first Bone of the Thumb.

Action: To pull the Thumb towards the Fingers.

INDICATOR,

Vel *Extensor Indicis Proprius*, vel *Cubito-super-phalangeus Primus Indicis.*

Origin: By an acute Fleshy beginning, from the middle of the posterior part of the Ulna, at the inner side of the Extensor Secundi Internodii Pollicis. Its Tendon passes under the same Ligament with the Extensor Digitorum Communis.

Insertion: Along with part of the Extensor Digitorum Communis, into the posterior part of the Fore Finger.

Action: To assist the Extensor Communis in extending all the joints of this Finger, as in pointing at any thing, hence called *Indicator.*

ABDUCTOR INDICIS.

Origin: From the Os Trapezium, and from the upper part and inner side of the Metacarpal Bone of the Thumb.

Insertion: By a short Tendon, into the outer and back part of the first Bone of the Fore Finger.

Action: To bring the Fore Finger towards the Thumb.

FLEXOR PARVUS MINIMI DIGITI,

Vel *Carpo-phalangeus Secundus.*

Origin: From the Uncus of the Os Unciforme, and adjacent part of the Annular Ligament. It passes obliquely over the under end of the following Muscle.

Insertion: By a roundish Tendon, into the inner part of the Base of the first Bone of this Finger.

Action: To bend the Little Finger, and assist the Adductor.

ABDUCTOR MINIMI DIGITI,

Vel *Carpo-phalangeus Minimi Digiti.*

Origin: Fleshy from the Os Pisiforme, and from that part of the Ligamentum Carpi Annulare Anterius next it; going nearly straight down at the inner side of the Hand.

Insertion: Tendinous, into the inner side of the Base of the first Bone of the Little Finger.

Action: To draw the Little Finger from the rest.

ADDUCTOR MINIMI DIGITI,

Vel *Metacarpeus*, vel *Carpo-metacarpeus Minimi Digiti.*

Origin: Fleshy from the edge of the Hook-like Process of the Os Unciforme, and from that part of the Ligamentum Carpi Annulare next to it.

Insertion: Tendinous into the inner side, and anterior or under extremity, of the Metacarpal Bone of the Little Finger.

Action: To bend the Metacarpal Bone, and bring this Finger towards the rest.

INTEROSSEI,

Vel *Metacarpo-phalangei Laterales.*

Origin: From the sides of the Metacarpal Bones. They fill up the spaces between these, and are something similar to the Lumbricales, but larger.

Insertion: By slender Tendons, along with those of the Lumbricales, into the sides of the Tendinous Expansions of the Extensor Digitorum Communis.

Action: To give the Fingers their lateral motions, and to assist a little, according to the situations into which they may be brought by the other Muscles, in bending or extending the first Phalanx of the Fingers.

Of the Interossei, three, seen in the Palm of the Hand, arise with single Heads, and are called *Interni*, vel *Palmares*; and four on the back of the hand, with double Heads, termed *Externi*, vel *Bicipites*, vel *Dorsales.* Part of the Externi, however, are also seen in the Palm of the Hand.

INTEROSSEI INTERNI.

PRIOR INDICIS.

Origin: From the outer or Radial side of the Metacarpal Bone of the Fore Finger.

Insertion: Into the outside of the Tendon on the back of the Fore Finger.

Action: To draw the Finger outwards, towards the Thumb.

POSTERIOR INDICIS.

Origin: From the inner or Ulnar side of the Metacarpal Bone of the Fore Finger.

Insertion: Into the inside of the Tendon on the back of the Fore Finger.

Action: To draw the Fore Finger inwards.

PRIOR ANNULARIS.

Origin: From the outside of the Metacarpal Bone of the Ring Finger.

Insertion: Into the outside of the Tendon on the back of the Ring Finger.

Action: To draw the Ring Finger outwards.

INTEROSSEUS AURICULARIS.

Origin: From the outside of the Metacarpal Bone of the Little Finger.

Insertion: Into the outside of the Tendon on the back of the Little Finger.

Action: To draw the Little Finger outwards.

INTEROSSEI EXTERNI.

Prior Medii Digiti.

Origin: From the corresponding sides of the Metacarpal Bones of the Fore and Middle Fingers.

Insertion: Into the outside of the Tendon on the back of the Middle Finger.

Action: To draw the Middle Finger outwards.

Posterior Medii Digiti.

Origin: From the corresponding sides of the Metacarpal Bones of the Middle and Ring Fingers.

Insertion: Into the inside of the Tendon on the back of the Middle Finger.

Action: To draw the middle Finger inwards.

Posterior Annularis.

Origin: From the corresponding sides of the Metacarpal Bones of the Ring and Little Fingers.

Insertion: Into the inside of the Tendon on the back of the Ring Finger.

Action: To draw the Ring Finger inwards.

The Fore-arm is *bent* by the Biceps Flexor Cubiti and Brachialis Internus, the following Muscles, on account of their attachments to the under end of the Os Humeri, assisting, though only in a small degree, viz. Palmaris Longus, Flexor Carpi Radialis, Flexor Carpi

Ulnaris, Flexor Digitorum Sublimis, Supinator Radii Longus, et Pronator Radii Teres;—*extended*, by the Triceps Extensor Cubiti, and Anconeus.

The Hand, which is here supposed to be placed by the side of the Body, with the Palm forwards, is *bent* by the Flexores Carpi Radialis et Ulnaris, assisted by the Palmaris Longus, Flexores Digitorum Sublimis et Profundus, and Flexor Longus Pollicis;—*moved backwards*, by the Extensores Carpi Radialis Longior et Brevior, Digitorum Communis, et Secundi Internodii Pollicis, and Indicator;—*moved laterally outwards*, by the Flexor Carpi Radialis, Extensores Carpi Radialis Longior et Brevior, assisted by the Extensores Primi et Secundi Internodii Pollicis;—*moved laterally inwards*, by the Flexor et Extensor Carpi Ulnaris, assisted by the Flexores Digitorum Sublimis et Profundus, and Extensor Digitorum Communis. By a succession of the above motions, the Hand can move in a Circle.

The *Supination* of the Hand is performed by the Supinator Radii Brevis, and Biceps Flexor Cubiti, assisted by the Supinator Radii Longus, and Extensor Secundi Internodii Pollicis;—and the *Pronation* by the Pronatores Radii Teres et Quadratus, assisted by the Palmaris Longus, Flexor Carpi Radialis, et Flexor Digitorum Sublimis.

The *Fingers* are *bent*, at the FIRST JOINT, by the Lumbricales, Interossei, Flexores Digitorum Sublimis et Profundus, et Brevis Minimi Digiti;—at the SECOND JOINT, by the Flexor Digitorum Sublimis, and in the Little Finger, by the Flexor Minimi Digiti;—at the THIRD JOINT, by the Flexor Digitorum Profundus.—

Extended in all the Joints, by the Extensor Digitorum Communis, assisted in the Index by the Indicator; and when the Fingers are moved beyond a straight line with the Metacarpal Bones, the Interossei and Lumbricales then act with the common Extensor;—*moved laterally*, by the Interossei, assisted in the Index by the Abductor Indicis, and in the Little Finger by the Abductor Minimi Digiti, which supplies the place of an Interosseous Muscle;—*moved in a Circle*, at the first Joint, by a succession of the above motions.

The THUMB, at the root of the Metacarpal Bone, is brought *towards* the middle of the Palm, by the Opponens Pollicis;—*from* the Palm, by the Extensores Ossis Metacarpi, et Primi Internodii Pollicis;—*moved towards* the Fore Finger by the Adductor,—and in the *contrary direction*, by the Abductor Pollicis. By a succession of the above motions, the Thumb performs, at this Joint, its *Rotation*.

At the *first Joint*, the Thumb is *bent* by the Flexor Brevis Pollicis;—*extended*, by the Extensor Primi Internodii Pollicis. At the *second Joint*, *bent* by the Flexor Longus Pollicis;—and *extended* by the Extensor Secundi Internodii Pollicis.

MUSCLES

OF

THE INFERIOR EXTREMITIES.

MUSCLES ON THE PELVIS AND THIGH, SERVING FOR THE MOTION OF THE THIGH AND LEG.

APONEUROSIS OF THE INFERIOR EXTREMITY.

PREVIOUS to the description of the Muscles of the Inferior Extremity, it is proper to take notice of the *Fascia Lata*, or Tendinous Expansion, which, as in the Superior Extremity, forms a general Covering to the Muscles, and sends off Partitions between them, to be connected to the Ridges and Processes of the Bones.

It is thick and strong on the outside of the Thigh and Leg, but towards the inner side of both, particularly on the former, it gradually turns thinner, and has rather the appearance of Cellular Membrane.

It descends from the Processes and other Projections on the outside of the Bones of the Pelvis, but more especially from the Tendons of the External Layers of the Muscles of the Loins and Abdomen.—See the description of the upper part of this Fascia in P. 215.

A little below the Trochanter Major, it is intimately connected to the Linea Aspera. At the Joint of the Knee it receives additions from the Tendons of the Extensors of the Leg, and is there connected with the outer and inner sides of the Head of the Tibia and Fibula. In the Leg, it is firmly fixed to the Spines or Ridges of the Tibia and Fibula, and at the under end, to the Bones of the Ankle, where part of it, thicker and stronger than the rest, is extended anteriorly from the Malleolus Internus and Os Naviculare, to the Malleolus Externus, and adjacent part of the Os Calcis, to form the Ligamentum Tarsi Annulare. It vanishes at last upon the Foot.

It serves the same general purposes with the Aponeurosis of the Superior Extremity.

PSOAS MAGNUS. }
ILIACUS INTERNUS. } *See p.* 237.

PECTINALIS, vel *Pectineus*, vel *Super-pubio-femoralis.*

Origin: Broad and Fleshy, from the upper and fore part of the Os Pectinis vel Pubis, between the upper part of the Foramen Thyroideum and Brim of the Pelvis. It runs downwards and outwards at the inner side of the Psoas Magnus.

Insertion: By a flat and short Tendon, into the Linea Aspera of the Os Femoris, a little below the Trochanter Minor.

Action: To pull the Thigh upwards and inwards, and to give it, and of course the Foot, a degree of rotation outwards.

TRICEPS ADDUCTOR FEMORIS.

Under this appellation are comprehended three distinct Muscles, viz. *Adductor Longus*, *Adductor Brevis*, and *Adductor Magnus*.

ADDUCTOR LONGUS, vel *Pubio-femoralis.*

Origin: By a strong roundish Tendon, from the upper and fore part of the Os Pubis, and Ligament of the Synchondrosis, at the inner side of the Pectinalis: It runs downwards and outwards.

Insertion: By a broad flat Tendon, into the middle of the Linea Aspera.

ADDUCTOR BREVIS, vel *Sub-pubio-femoralis.*

Origin: Tendinous, from the Os Pubis, at the side of its Symphysis, below and behind the former Muscle; it runs obliquely outwards.

Insertion: By a short flat Tendon, into the inner and upper part of the Linea Aspera, from a little below the Trochanter Minor, to the beginning of the Insertion of the Adductor Longus.

ADDUCTOR MAGNUS, vel *Ischio-femoralis.*

Origin: From the side of the Symphysis Pubis, a little lower than the former. The Origin is continued downwards along the Crus and Tuberosity of the Os Ischium. The Fibres run outwards and downwards, spreading out wide, and forming a very large Muscle.

Insertion: Into the whole length of the Linea Aspera; the under part of the Muscle extending along the Ridge which leads to the inner Condyle of the Os Femoris. It is also fixed by a roundish Tendon, into the upper part of that Condyle, a little above which, the Femoral Artery, in its course towards the Ham, passes between the Tendon of this Muscle and the Bone.

Action of the three Adductors: To bring the Thigh inwards and upwards, according to the different directions of their Fibres, and to assist a little in rolling it outwards.

OBTURATOR EXTERNUS,

Vel *Sub-pubio-trochantereus Externus.*

Origin: On the outer side of the Pelvis, by a semicircular Margin, from the Parts of the Ossa Pubis and Ischium, which form the anterior half of the Foramen Thyroideum, and from the Membrane which fills up that Foramen. The Fibres are collected like rays towards a centre, and pass outwards over the back part of the Cervix of the Os Femoris.

Insertion: By a strong round Tendon, into the Cavity at the inner and back part of the Root of the Trochanter Major, adhering in its course to the Capsular Ligament of the Thigh-bone.

Action: To roll the Thigh-bone obliquely outwards, and to prevent the Capsular Ligament from being pinched.

GLUTEUS MAXIMUS, vel *Sacro-femoralis.*

Origin: Fleshy, from the back part of the Spine of the Os Ilium; from the under and outer part of the Os Sacrum; from the Os Coccygis; and from the posterior Sacro-sciatic Ligaments, over which part of the inferior edge hangs in a Flap. The Fibres are collected into coarse Fasciculi, which run obliquely forwards and a little downwards. The upper part of it covers almost the whole of the Trochanter Major, and it is intimately connected with the broad Tendon of the Tensor Vaginæ Femoris. This Muscle is the largest of the Body, and composes the principal part of the Buttock.

Insertion: By a strong, thick, and broad Tendon, into the upper and outer part of the Linea Aspera, along which it is continued for some way down.

Action: To extend the Thigh, and pull it backwards and a little outwards. It extends also the Pelvis on the Thigh in standing; and, assisted by the other Glutei, maintains the equilibrium of the Body on the lower Extremity, which rests on the ground, while the other is carried forwards, as in walking.

GLUTEUS MEDIUS, vel *Ilio-trochantereus Magnus.*

Origin: Fleshy, from all that part of the Spine of the Os Ilium which is unoccupied by the Gluteus Maximus;

mus; from the upper part of the Dorsum of that Bone; and from an Aponeurosis which covers the Muscle, and joins the Fascia of the Thigh. It sends off a broad Tendon, which has its

Insertion: Into the outer and back part of the Trochanter Major.

Action: To pull the Thigh outwards, and a little backwards. The fore part of the Muscle assists in rolling it inwards.

GLUTEUS MINIMUS, vel *Ilio-trochantereus Parvus.*

Origin: Fleshy, from the lower half of the Dorsum of the Os Ilium. Its Origin is continued from the superior-anterior Spinous Process, along a rising of the Bone, as far as the great Sciatic Notch; and the Muscle runs in a radiated manner to a strong flat Tendon.

Insertion: Into the fore and upper part of the Trochanter Major.

Action: To assist the former in pulling the Thigh outwards, and a little backwards; and, along with other Muscles, in rolling it inwards.

PYRIFORMIS, vel *Sacro-trochantereus.*

Origin: By three Tendinous and Fleshy Heads, from the anterior Surface of the second, third, and fourth pieces of the Os Sacrum; and, becoming round and tapering, it passes out of the Pelvis, along with the Sciatic Nerve, through the great Notch of the Ilium, from which it receives the addition of a few Fleshy Fibres.

Insertion: By a roundish Tendon, into the upper part of the Cavity at the inner side of the root of the Trochanter Major.

Action: To assist in the Abduction of the Thigh, and in its rotation outwards.

Gemini, vel *Gemelli,* vel *Ischio-trochantereus.*

Origin: By two distinct Heads; the superior from the Spinous Process, and the inferior from the Tuberosity of the Os Ischium, and from the Sacro-sciatic Ligament. The two Heads are united by a Tendinous and Fleshy Membrane, and form a Sheath for the reception of the Tendon of the Obturator Internus.

Insertion: Tendinous and Fleshy, into the Cavity at the inner side of the root of the Trochanter Major, on each side of the Tendon of the Obturator Internus, to which they firmly adhere.

Action: To roll the Thigh outwards, and to prevent the Tendon of the Obturator Internus from starting out of its place while the Muscle is in action.

Obturator Internus,

Vel *Marsupialis*; vel *Sub-pubio-trochantereus Internus.*

Origin: Within the Pelvis, by a semicircular Fleshy margin, from the anterior half of the Foramen Thyroideum, and, in part, from the Obturator Ligament. Its Fibres converge, and send off a round Tendon, which passes over the Os Ischium, between the Spine and Tuber of that Bone, as a rope passes over a pulley.

—Where it goes over the Capsular Ligament of the Thigh-bone, it is inclosed in the Sheath of the Gemini.

Insertion: By a round Tendon, along with the Gemini, into the large Pit at the root of the Trochanter Major.

Action: To roll the Thigh obliquely outwards.

QUADRATUS FEMORIS, vel *Ischio-sub-trochantereus.*

Origin: Tendinous and Fleshy, from the outer side of the Tuberosity of the Os Ischium; running transversely outwards.

Insertion: Fleshy, into a rough Ridge continued from the root of the great to that of the small Trochanter.

Action: To roll the Thigh outwards.

This Muscle is occasionally wanting.

The Pyriformis, Gemini, Quadratus, and Obturatores, which are the Rotators of the Thigh when it is in a line with the Body, become its Abductors when it is in the bended state.

TENSOR VAGINÆ FEMORIS,

Vel *Ilio-aponeuroso-femoris.*

Origin: By a narrow, Tendinous, and Fleshy beginning, from the external part of the anterior-superior Spinous Process of the Os Ilium. It goes downwards, and a little backwards, forming a thick Fleshy Belly, which is inclosed in a doubling of the Aponeurosis or Vagina of the Thigh.

Insertion: A little below the Trochanter Major, into the inner Surface of the Aponeurosis which covers the outside of the Thigh.

Action: To stretch the Aponeurosis, and to assist in the Abduction of the Thigh, and in its rotation inwards.

Sartorius, vel *Ilio-pretibialis.*

Origin: Tendinous, from the superior-anterior Spinous Process of the Os Ilium, at the inner side of the Tensor Vaginæ Femoris. It soon becomes Fleshy, runs obliquely downwards over the Muscles situated upon the fore and inner side of the Thigh, and is the longest Muscle of the Body.

Insertion: By a broad and thin Tendon, into the inner side of the Tibia, near the inferior part of its Tubercle.

Action: To bend the Knee, and bring one Leg obliquely inwards across the other, as tailors do at their work, from which circumstance the Muscle obtains its name.

Gracilis, vel *Rectus Internus,* vel *Sub-pubio-pretibialis.*

Origin: By a thin Tendon, from the Os Pubis, near the Symphysis; soon becoming Fleshy, and descending in a direct course by the inside of the Thigh.

Insertion: Tendinous, into the Tibia, lower than the Sartorius.

Action: To assist the Sartorius in making the full Flexion of the Knee, after it has been bent to a certain degree by the Flexors on the back part of the Thigh.

RECTUS, vel *Gracilis Anterior*, vel *Ilio-rotuleus.*

Origin: Fleshy, from the inferior-anterior Spinous Process of the Os Ilium; and Tendinous, from the Dorsum of that Bone, a little above the Acetabulum. It runs down over the anterior part of the Capsular Ligament which incloses the Cervix of the Os Femoris, and, in its passage along the fore part of the Thigh, becomes gradually larger as far as its middle, after which it decreases towards its lower extremity. In the middle of the fore part of the Muscle, there is a longitudinal Tendinous Line, from which Fleshy Fibres run off like the plumage of a feather; the Tendon itself being most conspicuous behind.

Insertion: Tendinous, into the upper part of the Patella.

Action: To extend the Leg.

CRURALIS, vel *Crureus*, or *Middle of the Tri-femoro-rotuleus.*

Origin: Fleshy, from between the two Trochanters of the Os Femoris, but nearer the Minor; and from the fore part of the Thigh-Bone to near its under extremity. Its sides are connected to both Vasti Muscles; anteriorly, it is covered by the Rectus, the Tendon of which it joins near the lower part of the Thigh.

Insertion: Into the upper and back part of the Patella, behind the Rectus.

Action: To assist in the extension of the Leg.

VASTUS

VASTUS EXTERNUS,

Or *Outer Part of the Tri-femoro-rotuleus.*

Origin: Broad, Tendinous, and Fleshy, from the outer part of the Root of the Trochanter Major. Its Origin is continued from the Trochanter, along the whole outer side of the Linea Aspera, to near the external Condyle of the Os Femoris, by Fleshy Fibres, which form the principal part of the outer portion of the Thigh, and run obliquely forwards to a middle Tendon, where they terminate.

Insertion: Into the upper and outer part of the Patella, at the edge of the Tendon of the Rectus, with which it is connected. Part of it ends in an Aponeurosis, which is fixed to the Head of the Tibia, and afterwards is continued to the Leg.

Action: To extend the Leg.

VASTUS INTERNUS,

Or *Inner Part of the Tri-femoro-rotuleus.*

Origin: Tendinous and Fleshy, from between the fore part of the Os Femoris, and root of the Trochanter Minor. The Origin is also continued along the whole inside of the Linea Aspera, by Fibres running obliquely forwards and downwards, which occupy the under and inner side of the Thigh.

Insertion: Tendinous, at the side of the Crureus, with which it is connected, into the upper and inner edge of the Patella, continuing Fleshy lower than the Vastus Externus.

ternus. Part of it likewise ends in an Aponeurosis, which is fixed to the Head of the Tibia, and afterwards is continued to the Leg.

Action: To assist the three former Muscles in extending the Leg; then the Patella, fixed to the Tubercle of the Tibia by a strong Ligament, supplies the office of a Pulley.

SEMITENDINOSUS, vel *Ischio-pretibialis.*

Origin: Tendinous and Fleshy, in common with the long Head of the Biceps, from the posterior part of the Tuberosity of the Os Ischium. Its Fleshy Belly runs down the back part of the Thigh, and sends off a long roundish Tendon, which, passing by the inner side of the Knee, afterwards becomes flat.

Insertion: Into the inside of the Ridge of the Tibia, a little below the Tubercle, and connected to the under edge of the Gracilis.

Action: To bend the Leg, and, when bent, to roll it inwards.

SEMIMEMBRANOSUS, vel *Ischio-poplito-tibialis.*

Origin: By a broad flat Tendon, from the upper and back part of the Tuberosity of the Os Ischium. It is situated behind the Semitendinosus. The Fibres composing its Fleshy Belly form a semi-penniform Muscle, by running in an oblique direction towards a flat Tendon at its inner and under part.

Insertion: Into the inner and back part of the Head of the Tibia.

Action: To bend the Leg, and bring it directly backwards.

BICEPS FLEXOR CRURIS,

Vel *Ischio-femoro-peronealis.*

Origin: By two distinct Heads. The first, or *Long Head*, arises in common with the Semitendinosus, from the upper and back part of the Tuberosity of the Os Ischium. The second, or *Short Head*, arises from the Linea Aspera, a little below the termination of the Gluteus Maximus, by a Fleshy acute beginning, which soon grows broader, as it descends to join the first Head a little above the external Condyle of the Os Femoris.

Insertion: By a strong Tendon, into the upper and outer part of the Head of the Fibula.

Action: To bend the Leg, and, when the Leg is bent, to roll it outwards.

The Semitendinosus and Semimembranosus form the *inner Ham-string*, and the Biceps the *outer Ham-string*, between which the great Vessels and Nerves are situated, which run to the Leg.

POPLITEUS, vel *Femoro-poplito-tibialis.*

Origin: By a small round Tendon, from the outer and under part of the external Condyle of the Os Femoris, and from the back part of the Capsular Ligament of the Joint. In passing the Joint, it becomes Fleshy, and spreads out, the Fibres running obliquely inwards and downwards, covered with a Tendinous Membrane.

Insertion: Thin and Fleshy, into a Ridge at the upper and inner part of the Tibia, a little below its Head.

Action: To assist in bending the Leg, and, when the Leg is bent, to roll it inwards. The Muscle also prevents the Capsular Ligament from being pinched.

MOTIONS OF THE THIGH AND LEG.

The THIGH is *moved forwards*, by the Psoas Magnus and Iliacus Internus, assisted by the Pectinalis, Adductor Longus, Adductor Brevis, and upper Portion of the Adductor Magnus Femoris, Tensor Vaginæ Femoris, Sartorius, Gracilis, and Rectus Femoris;—*backwards*, by the Glutei Maximus, Medius, et Minimus, under Portion of the Triceps Adductor Magnus, Semitendinosus, Semimembranosus, and long Head of the Biceps Flexor Cruris;—*inwards*, by the Psoas Magnus, Iliacus Internus, Pectinalis, Triceps Adductor Femoris, Sartorius, Gracilis, Semitendinosus, Semimembranosus, Quadratus Femoris, Obturatores Externus et Internus; —*outwards*, by the Glutei Maximus, Medius, et Minimus, and Tensor Vaginæ Femoris. In the bent state, the Pyriformis, Gemini, Obturatores Externus et Internus, and Quadratus Femoris, become *Abductors*. By a succession of the motions mentioned above, the Knee can move in a Circle.—The Thigh is *rolled inwards*, by the fore part of the Gluteus Medius, Gluteus Minimus,

mus, Tensor Vaginæ Femoris, Sartorius, Gracilis, and Semitendinosus, —and *rolled outwards*, by the Pyriformis, Gemini, Obturatores Externus et Internus, and Quadratus Femoris, assisted by the Psoas Magnus, Iliacus Internus, and Gluteus Minimus. In the bent state, the Muscles which were formerly the Abductors, now become the Rotators outwards.

When the Leg is made the fixed point, the different Muscles which formerly moved the Thigh, now move the Trunk and Pelvis upon the Thigh.

The LEG is *bent*, by the Semitendinosus, Semimembranosus, Biceps Flexor Cruris, and Popliteus, assisted by the Sartorius, Gracilis, Gastrocnemius Externus, and Plantaris ;—*extended*, by the Rectus Femoris, Cruralis, Vasti Externus et Internus. The Gluteus Maximus, and Tensor Vaginæ Femoris, from their connections with the Fascia Lata Femoris, assist a little both in the flexion and extension of the Knee. In the bended state of the Leg, the Semitendinosus, Semimembranosus, Gracilis, and Popliteus, perform *rotation inwards*, —and the Biceps Flexor Cruris, *rotation outwards*.

MUSCLES SITUATED ON THE LEG AND FOOT, SERVING FOR THE MOTION OF THE FOOT AND TOES.

GASTROCNEMIUS EXTERNUS, vel *Gemellus*, vel *Bifemoro-calcaneus.*

Origin: By two distinct Heads; one from the upper and back part of the internal Condyle of the Os Femoris, and from a little above the Condyle, by two separate beginnings: The other, Tendinous from the upper and back part of the external Condyle. A little below the Joint, their Fleshy Bellies meet in a middle Tendon, the union behind giving the appearance of a longitudinal Raphè. Below the middle of the Tibia, the Muscle sends off a broad thin Tendon, which, becoming gradually narrower, joins that of the Gastrocnemius Internus, a little above the Ankle.

GASTROCNEMIUS INTERNUS,

Vel *Soleus*, vel *Tibio-calcaneus.*

Origin: By two Heads. The first from the back part of the Head, and upper and back part of the Body of the Fibula: The other from the back part of the Tibia, running inwards along the under edge of the Popliteus, towards the inner part of the Bone, from which it receives Fleshy Fibres for some way down, and forms a Muscle, which is of the compound Penniform kind. This is covered by the Tendon of the Gastrocnemius Externus, and descends, Fleshy, nearly as far as the extremity of the Tibia, a little above which, the Tendons of both Gastrocnemii unite, and form a strong round Cord, called *Tendo* ACHILLIS, or simply *Heel Tendon.*

Insertion: Into the upper and back part of the Os Calcis, by the projection of which the Tendo ACHILLIS is enabled to act more powerfully upon the Foot.

Action : To extend the Foot, by raising the Heel.

By the Bellies of the two Gastrocnemii, but particularly of the Externus, the Calf of the Leg is formed.

PLANTARIS, vel *Femoro-calcaneus Parvus.*

Origin : Thin and Fleshy, from the upper and back part of the external Condyle of the Os Femoris, and from the Capsular Ligament of the Joint. A little below the Head of the Fibula, it sends off a slender Tendon, the longest of the Body, which descends obliquely inwards, between the inner Heads of the Gastrocnemii, and afterwards runs along the inner Edge of the Tendo ACHILLIS, to which it is so closely connected, as to be sometimes overlooked.

Insertion: Into the inside of the posterior part of the Os Calcis, below the Tendo ACHILLIS.

Action : To assist the Gastrocnemii, though in a small degree only, and to pull the Capsular Ligament of the Knee from between the Bones. It likewise agitates a Fatty substance belonging to the Bursæ Mucosæ, at the insertion of the Tendo ACHILLIS.

This Muscle is sometimes, though very rarely, wanting.

TIBIALIS ANTICUS, vel *Tibio-super-tarseus.*

Origin : Tendinous, from the upper and fore part of the Tibia, between its Tubercle and Articulation with the Fibula. It then runs down, Fleshy, on the outside of the Tibia, adhering to it and to the upper part of the Interosseous Ligament. Towards the under part of the Leg, it sends off a strong round Tendon, which passes under the Ligamentum Tarsi Annulare, near the inner Ankle, and, running over the Astragalus and Os Naviculare, it has its

Insertion : Tendinous, into the middle of the Os Cuneiforme Internum and Base of the Metatarsal Bone of the Great Toe.

Action : To bend the Foot.

TIBIALIS POSTICUS, vel *Tibio-sub-tarseus.*

Origin : Fleshy, from the upper and fore part of the Tibia, under the process which joins it to the Fibula; then, passing through a Fissure in the upper part of the Interosseous Ligament, it continues its Origin from the back part of the Fibula, next the Tibia, and from near one half of the upper part of the last-named Bone, as also from the Interosseous Ligament; the Fibres running towards a middle Tendon, which, in its descent, becomes round, and passes in a Groove behind the Malleolus Internus.

Insertion : Tendinous, chiefly into the upper and

inner

inner part of the Os Naviculare, and partly into the under Surface of the Tarsal Bones, by separate Slips, the last of which goes to the root of the Metatarsal Bone of the middle Toe.

Action: To extend the Foot, and, with the assistance of the Tibialis Anticus, to turn the Toes inwards, and the outer Edge of the Foot downwards.

PERONEUS LONGUS,

Vel *Primus*, vel *Peroneo-sub-tarseus.*

Origin: Tendinous and Fleshy, from the fore part of the Head of the Fibula; and Fleshy, from the outer part of that Bone, down to within a hand-breadth of the Ankle. The Fibres run in a Penniform manner towards a long Tendon, which becomes round, and, inclosed in a Sheath, passes through a Channel behind the Malleolus Externus. It is then reflected to the Sinuosity of the Os Calcis, runs along a Groove in the Os Cuboides, and goes obliquely across the Bones in the middle of the Sole.

Insertion: Tendinous, into the outside of the root of the Metatarsal Bone of the Great Toe, and partly into the Os Cuneiforme Internum.

Action: To extend the Foot a little, to draw it outwards, and to turn the inner edge of it downwards.

PERONEUS BREVIS,

Vel *Secundus*, vel *Peroneo-metatarseus Magnus.*

Origin: Fleshy, from the outer part of the Fibula, beginning some way above the middle height of the Bone, and continuing its adhesion as far as the Malleolus Externus. The Fibres run, like those of the former Muscle, to an external Tendon, which becomes round, passes behind the outer Ankle, where it is included in the same Sheath with the Tendon of the preceding Muscle, and there crossing behind that Tendon, runs forward in a Sheath proper to itself.

Insertion: Tendinous, into the root and external part of the Metatarsal Bone of the Little Toe.

Action : To assist the former Muscle in pulling the Foot outwards, its outer edge upwards, and to extend it in a small degree.

EXTENSOR LONGUS DIGITORUM,

Vel *Peroneo-super-phalangeus Communis.*

Origin : Tendinous and Fleshy, from the upper and outer part of the Head of the Tibia, and from the Head, and almost the whole length of the anterior Spine of the Fibula. It arises, also, Fleshy, from the Aponeurosis which covers the upper and outer part of the Leg, and from the Interosseous Ligament. Under the Ligamentum Tarsi Annulare, it splits into four round Tendons, which pass along the upper part of the Foot.

Insertion: Into the Base of the first Phalanx of the four small Toes, by flat Tendons, which are afterwards expanded over the upper side of the Toes as far as the root of the last Phalanx.

Action: To extend all the Joints of the four small Toes, and to assist in the flexion of the Ankle.

PERONEUS TERTIUS *of* ALBINUS,

Vel *Peroneo-metatarseus Minor*,

Is a Portion of the former Muscle.

Origin: From the middle of the Fibula, in common with the Extensor Longus Digitorum. It continues down to near the Malleolus Externus, and sends its Fleshy Fibres forwards to a Tendon which passes under the Ligamentum Annulare.

Insertion: Into the root of the Metatarsal Bone of the Little Toe.

Action: To assist in bending the Foot.

EXTENSOR BREVIS DIGITORUM,

Vel *Calco-super-phalangeus Communis*.

Origin: Fleshy and Tendinous, from the outer and fore part of the Os Calcis; soon forming a Fleshy Belly, which is divided into four Portions. These send off an equal number of Tendons, which pass over the upper part of the Foot, crossing under those of the former Muscle.

Insertion: By four slender Tendons, into the Great Toe, and Tendinous Expansion continued from the Long Extensors of all the Small Toes, excepting the little one.

Action: To assist in the extension of the Toes.

APONEUROSIS

Aponeurosis Plantaris.

This, like the Aponeurosis Palmaris, is a strong Tendinous Expansion, which covers the Muscles, Vessels, and Nerves of the Sole.

It arises from the Tuberosity at the under and back part of the Os Calcis, and is divided into three Portions, which run forwards, to be connected to the Heads of the Metatarsal Bones of all the Toes. The middle Portion is subdivided into five Slips, which split at the roots of the Toes, and embrace the Tendons of the Flexor Muscles.

Besides serving the general purpose of Aponeuroses, it performs the office of a Ligament, by binding the two ends of the arch of the Foot together.

Flexor Brevis Digitorum,

Vel *Flexor Sublimis*, vel *Perforatus*, vel *Calco-sub-phalangeus Communis.*

Origin: Narrow and Fleshy, from the inferior-anterior part of the Tuberosity of the Os Calcis, and from the Aponeurosis Plantaris. It forms a thick Fleshy Belly, which sends off four small Tendons, that split for the passage of the Tendons of the Flexor Longus.

Insertion: Into the second Phalanx of the four small Toes.

Action: To bend the first and second Joints of the Toes, but particularly the second.

The Tendon of the Little Toe is frequently wanting.

FLEXOR LONGUS DIGITORUM,

Vel *Flexor Profundus*, vel *Perforans*, vel *Tibio-phalangeus Communis.*

Origin : By an acute Tendon, which soon becomes Fleshy, from the back part of the Tibia, at the under edge of the Popliteus; and this Origin is continued down the inner edge of the Bone, by short Fleshy Fibres ending in its Tendon. It arises also by Tendinous and Fleshy Fibres, from the outer edge of the Tibia; and between this double order of Fibres, the Tibialis Posticus lies inclosed. After going under two Annular Ligaments behind the inner Ankle, it passes through a Sinuosity at the inside of the Os Calcis; and about the middle of the Sole, receives a Tendon from the Flexor Longus Pollicis. It then divides into four Tendons, which run through the Slits of the Perforatus.

Insertion : Into the Base of the third Phalanx of the four smaller Toes; the Tendons of this, as well as of the Flexor Brevis, being inclosed upon the Toes by Annular Ligaments.

Action : To bend the different Joints of the Toes, particularly the last one.

FLEXOR DIGITORUM ACCESSORIUS,

Vel *Massa Carnea* JACOBI SYLVII.

Origin : By two Portions; the inner Fleshy, from the Sinuosity of the Os Calcis; the outer Tendinous, but soon becoming Fleshy, from the fore and outer part of that Bone.

Insertion: Into the Tendon of the Flexor Longus Digitorum, before it divides into smaller Tendons.

Action: To assist the Flexor Longus.

LUMBRICALES, vel *Planto-sub-phalangeus.*

Origin: By four Tendinous and Fleshy beginnings, from the Tendon of the Flexor Profundus, just before its division. They run forwards, under the same general appearance with those in the Hand, but are somewhat smaller.

Insertion: By four slender Tendons, at the inside of the first Joint of the four small Toes, into the Tendinous Expansion sent from the Extensors to cover the upper part of the Toes.

Action: To increase the flexion of the Toes, and to draw them inwards.

EXTENSOR PROPRIUS POLLICIS,

Vel *Extensor Longus*, vel *Peroneo-super-phalangeus Pollicis.*

Origin: By an acute, Tendinous, and Fleshy beginning, from the fore part of the Fibula, some way below its Head. It continues its Origin from the same Bone to near the outer Ankle, by Fleshy Fibres which descend obliquely towards a Tendon.

Insertion: Tendinous, into the posterior part of both the Bones of the Great Toe.

Action: To extend the Great Toe, and assist in bending the Ankle.

FLEXOR LONGUS POLLICIS,

Vel *Peroneo-sub-phalangeus Pollicis.*

Origin: Tendinous and Fleshy, from the back part of the Fibula, some way below its Head; being continued down the same Bone, almost to its under end, by a double order of oblique Fleshy Fibres. Its Tendon passes under an Annular Ligament behind the inner Ankle, then through a Fossa in the Astragalus.

Insertion: Into the last Joint of the Great Toe.

Action: To bend the Great Toe, particularly the last Joint.

FLEXOR BREVIS POLLICIS,

Vel *Tarso-sub-phalangeus Pollicis.*

Origin: Tendinous, from the under and fore part of the Os Calcis, and from the Os Cuneiforme Externum. It is inseparably united with the Abductor and Adductor Pollicis.

Insertion: Into the external Os Sesamoideum, and root of the first Bone of the Great Toe.

Action: To bend the first Joint of the Great Toe.

ABDUCTOR POLLICIS, vel *Calco-sub-phalangeus Pollicis.*

Origin: Fleshy, from the anterior and inner part of the Protuberance of the Os Calcis, and Tendinous from the same Bone, where it joins with the Os Naviculare.

Insertion: Tendinous, into the internal Os Sesamoideum, and root of the first Bone of the Great Toe.

Action: To pull the Great Toe from the rest.

ADDUCTOR POLLICIS,

Vel *Metatarso-sub-phalangeus Pollicis.*

Origin: By a long thin Tendon, from the under part of the Os Calcis, from the Os Cuboides, from the Os Cuneiforme Externum, and from the root of the Metatarsal Bone of the Second Toe. The Muscle is divided into two Fleshy Portions.

Insertion: Into the external Os Sesamoideum, and root of the Metatarsal Bone of the Great Toe.

Action: To pull the Great Toe towards the rest.

ABDUCTOR MINIMI DIGITI,

Vel *Calco-sub-phalangeus Minimi Digiti.*

Origin: Tendinous and Fleshy, from the edge of a Cavity on the under part of the Protuberance of the Os Calcis, and from the root of the Metatarsal Bone of the Little Toe.

Insertion: Into the outer part of the root of the first Bone of the Little Toe.

Action: To draw the Little Toe outwards.

FLEXOR BREVIS MINIMI DIGITI,

Vel *Tarso-sub-phalangeus Minimi Digiti.*

Origin : Tendinous, from the Os Cuboides, near the Groove for lodging the Tendon of the Peroneus Longus; and Fleshy, from the outer and back part of the Metatarsal Bone of the Little Toe.

Insertion : Into the anterior extremity of the Metatarsal Bone, and root of the first Bone of the Little Toe.

Action : To bend this Toe.

TRANSVERSALIS,

Vel *Metatarso-sub-phalangeus Transversalis Pollicis.*

Origin : Tendinous, from the under and fore part of the Metatarsal Bone of the Great Toe, and from the internal Os Sesamoideum of the first Joint. It forms a Fleshy Belly, which runs transversely between the Metatarsal Bones and Flexor Muscles of the other Small Toes.

Insertion : Tendinous, into the under and outer part of the anterior extremity of the Metatarsal Bone of the Little Toe, and Ligament of the Toe next it.

Action : To contract the Foot, by bringing the roots of the outer and inner Toes towards each other.

INTEROSSEI,

Vel *Metatarso-phalangei Laterales.*

The Interossei arise Tendinous and Fleshy from, and fill the spaces between, the Metatarsal Bones. Three, called *Interni*, vel *Plantares*, arise with single Heads, and are placed in the Sole; and four, termed *Externi*, vel *Bicipites*, vel *Dorsales*, arise with double Heads, and appear on both sides of the Foot.

The Insertion of all the Interossei is, by slender Tendons, into the Expansion sent off from the Tendons of the Lumbricales, and of the Extensor Muscles of the Toes.

INTEROSSEI INTERNI.

Prior, vel *Abductor Medii Digiti.*

Origin: From the inside of the Metatarsal Bone of the Middle Toe.

Insertion: Into the inside of the root of the first Bone of the Middle Toe.

Action: To pull the Middle Toe inwards.

Prior, vel *Abductor Tertii Digiti.*

Origin: From the inner and under part of the Metatarsal Bone of the third of the small Toes.

Insertion: Into the inside of the root of the first Bone of the third of the small Toes.

Action: To pull the third of the small Toes inwards.

PRIOR, vel *Adductor Minimi Digiti.*

Origin: From the inside of the Metatarsal Bone of the Little Toe.

Insertion: Into the inside of the root of the first Bone of the Little Toe.

Action: To pull the Little Toe inwards.

INTEROSSEI EXTERNI, vel *Bicipites.*

PRIOR, vel *Abductor Indicis.*

Origin: From the contiguous sides of the Metatarsal Bones of the Great and Fore Toes.

Insertion: Into the inside of the root of the first Bone of the Fore Toe.

Action: To pull the Fore Toe inwards.

POSTERIOR, vel *Adductor Indicis.*

Origin: From the contiguous sides of the Metatarsal Bones of the Fore Toe, and second of the small Toes.

Insertion: Into the outside of the root of the first Bone of the Fore Toe.

Action: To pull the Fore Toe outwards.

POSTERIOR, vel *Adductor Medii Digiti.*

Origin: From the contiguous sides of the Metatarsal Bones of the second and third of the small Toes.

Insertion: Into the outside of the root of the first Bone of the second of the small Toes.

Action: To pull this Toe outwards.

POSTERIOR, vel *Adductor Tertii Digiti.*

Origin: From the contiguous sides of the Metatarsal Bones of the third and fourth of the small Toes.

Insertion: Into the outside of the root of the first Bone of the third of the small Toes.

Action: To pull this Toe outwards.

MOTIONS OF THE FOOT AND TOES.

The FOOT is *bent*, or its fore part *raised*, by the Tibialis Anticus, Extensor Digitorum Longus, Peroneus Tertius, Extensor Proprius Pollicis;—*extended*, by the Gastrocnemii Externus et Internus, and Plantaris, assisted by the Tibialis Posticus, Peronei Longus et Brevis, Flexores Longus Digitorum et Pollicis;—the fore part *turned inwards*, by the Tibiales Anticus et Posticus, assisted by the Extensor Pollicis Proprius, Flexores Longus Digitorum et Pollicis;—*turned outwards*, by the Peronei Longus, Brevis, et Tertius, and Extensor Longus Digitorum. The inner edge *turned upwards*, by the Tibiales Anticus et Posticus;—the outer edge *raised*,

raised, by the Peronei Longus et Brevis. By being bent, extended, and moved laterally, the Foot performs its circular motion.

The TOES are *bent* at the *first Joint*, by the Lumbricales, Interossei, Flexores Digitorum Brevis et Longus, assisted, in the Little Toe, by the Flexor Brevis, et Abductor Minimi Digiti;—*extended*, by the Extensor Longus Digitorum, and the Extensor Brevis Digitorum, the Little Toe excepted; and when the Toes are moved beyond a straight line with the Metatarsal Bones, the Lumbricales and Interossei assist the Extensors; —*moved laterally*, by the Interossei, according as they happen to be placed upon the Tibial or Fibular side of the Toes, and these assisted in the Little Toe by the Abductor Minimi Digiti;—*bent* at the *second Joint*, by the Flexor Brevis, and at the *third Joint*, by the Flexores Profundus et Accessorius Digitorum;—*extended*, by the Extensor Longus Digitorum, and the Extensor Brevis Digitorum, with the exception of the Little Toe. The *Great Toe* is *bent*, by the Flexores Longus et Brevis Pollicis, assisted occasionally by the Adductor and Abductor;—*extended*, by the Extensores Proprius Pollicis et Brevis Digitorum;—*moved inwards*, by the Abductor,—and *outwards*, by the Adductor Pollicis, and Transversalis Pedis.

PART III.

OF THE

BURSÆ MUCOSÆ;

AND OF THE

LIGAMENTS

AND

OTHER PARTS OF THE JOINTS.

OF THE

BURSÆ MUCOSÆ.

THE BURSÆ MUCOSÆ belong chiefly to the Extremities, though a few also exist in other parts of the Body. The greater number of them are constant, some are only met with occasionally. They are found between parts exposed to friction, as between Tendons and Bones, where these play upon each other, as at the insertion of the Biceps Flexor Cubiti:

Or between Tendon and Cartilage, as where the Peroneus Longus crosses the Sole:

Or completely surrounding the Tendons, and lining their Sheaths, as around the Tendons of the Flexores Digitorum:

Or where Tendons rub on each other, as between those of the Extensores Carpi Radiales and Extensores Pollicis:

Or between Tendons and External Parts, as over the Tendons of the Flexores Digitorum in the Palm of the Hand:

Or between Tendons and Ligaments of the Joints, as between the Tendons of the Flexores Digitorum and Ligamentum Carpi Capsulare.

They are found in a few places where Processes of Bone play upon Ligaments, as between the Acromion Scapulæ and Capsular Ligament of the Humerus:

Or where the Bones play on each other, as between the Clavicle and Coracoid Process of the Scapula.

Some of the Bursæ of contiguous Tendons communicate with each other, as between the Extensor Carpi Radialis and Extensor Secundi Internodii Pollicis.

Others communicate, not only in Adults, but often also in Children, with the Cavity of the Joints, as behind the Tendon of the Extensors of the Leg; though this is more frequently the case in advanced age.

The Bursæ in general are either of a roundish or oval form, from which they have been arranged under two classes, viz. the *Spherical* and *Vaginal.*

Their structure is the same with that of the inner Layer of the Capsular Ligament of the Joints.

Like that, they are formed of a thin Pellucid Serous Membrane, possessing little sensibility, and joined to the surrounding parts by Cellular Substance, which, in many places, is intermixed with Fat.

Like the Capsule of the Joint, they have commonly a thin Layer of Cartilage, or of tough Membrane, between them and the Bone.

Like it, they have reddish-coloured Masses of Fat, projecting into their Cavities, from the edges of which Fringes are sent off; as behind the Ligament of the Patella, or at the insertion of the Tendo ACHILLIS.

Like it also, the inside of the Bursæ is remarkably smooth, being lubricated with the same kind of Gelatinous Fluid which is found in the Cavities of the Joints, and which serves the same general purpose with that of the Joints, viz. to lessen Friction, and prevent the consequences which would otherwise result from it.

BURSÆ MUCOSÆ

OF

THE HEAD AND NECK.

THE Bursæ of the Head and Neck are small when compared with those of the Extremities. The following have lately been described by Authors, viz.

A Bursa between the Tendon of the Superior Oblique Muscle of the Eye and its Trochlea.

A Bursa belonging to the Tendon of the Digastric Muscle, where it is fixed to the Os Hyoides.

A Bursa belonging to the Tendon of the Circumflexus Palati, where it plays upon the inner Plate of the Pterygoid Process of the Sphenoid Bone.

A Bursa under the Masseter.

A Bursa under the upper end of the Sterno-hyoideus.

BURSÆ MUCOSÆ

OF

THE SUPERIOR EXTREMITIES.

BURSÆ *about the* JOINT *of the* SHOULDER.

A SMALL Bursa sometimes found between the Tendon of the Subclavius and Cartilage of the first Rib.

A Bursa under the Clavicle, where it plays upon the Coracoid Process of the Scapula.

A large Bursa between the Acromion Scapulæ and Ligament, joining it to the Coracoid Process, and the Capsular Ligament of the Humerus.

A small Bursa between the point of the Coracoid Process and Capsular Ligament of the Humerus. This is sometimes wanting.

A Bursa between the Tendon of the Subscapularis Muscle and Capsular Ligament of the Humerus, which frequently communicates with the Cavity of the Joint.

A small Bursa under the Tendon of the Infra-Spinatus.

A Bursa, not constant, between the Origin of the Coraco-brachialis and short Head of the Biceps Muscle, and Capsular Ligament of the Humerus.

A

A Bursa between the Tendon of the Teres Major and the Os Humeri, and upper part of the Tendon of the Latissimus Dorsi.

A small Bursa between the Tendon of the Latissimus Dorsi and Os Humeri.

A Bursa between the Tendon of the long Head of the Biceps Flexor Cubiti and Body of the Humerus.

BURSÆ *about the* JOINT *of the* ELBOW.

A Bursa, with a *Peloton* or Mass of Fat, between the Tendon of the Biceps and a Cartilage which incrusts the Tubercle of the Radius.

A small Bursa between the Tendon common to the Extensor Carpi Radialis Brevior, Extensor Digitorum Communis, and Round Head of the Radius.

A small Bursa, not very constant, between the Tendon of the Triceps Extensor Cubiti and Olecranon.

A small Bursa between the Head of the Radius and the Anconeus.

Between the Integuments of the Elbow, and Olecranon of the Ulna, a Sac is found, especially in an old person, which is sometimes filled with a Glairy Fluid.

BURSÆ *upon the Under Part of the* FORE-ARM *and the* HAND.

A very large Bursa surrounding the Tendon of the Flexor Pollicis Longus.

Four long Bursæ lining the Sheaths which inclose the Tendons of the Flexors upon the Fingers.

Four short Bursæ on the fore part of the Tendons of the Flexor Digitorum Sublimis in the Palm of the Hand.

A large Bursa between the Tendon of the Flexor Pollicis Longus, the fore part of the Radius, and Capsular Ligament of the Wrist and Os Trapezium.

A large Bursa between the Tendons of the Flexor Digitorum Profundus, and the fore part of the end of the Radius and Capsular Ligament of the Wrist.

These two last-mentioned Bursæ are sometimes found to communicate with each other.

A Bursa between the Tendon of the Flexor Carpi Radialis and Os Trapezium.

An inconstant Bursa between the Tendon of the Flexor Carpi Ulnaris and Os Pisiforme.

A Bursa between the Tendon of the Extensor Ossis Metacarpi Pollicis and Radius.

A large Bursa common to the Extensores Carpi Radiales, where they cross behind the Extensor Ossis Metacarpi Pollicis.

Another Bursa common to the Extensores Carpi Radiales, where they cross behind the Extensor Secundi Internodii Pollicis.

A third Bursa at the insertion of the Tendon of the Extensor Carpi Radialis Brevior.

A Bursa for the Tendon of the Extensor Secundi Internodii Pollicis, which communicates with the second Bursa common to the Extensores Carpi Radiales.

Another Bursa between the Tendon of the Extensor Secundi Internodii Pollicis and Metacarpal Bone of the Thumb.

A Bursa between the Tendons of the Extensor of the Fore, Middle, and Ring Fingers, and Ligament of the Wrist.

A Bursa for the Tendons of the Extensor of the Little Finger.

A Bursa between the Tendon of the Extensor Carpi Ulnaris and Ligament of the Wrist.

Sometimes minute Bursæ are found between the Tendons of the Lumbricales and Interossei, at the Roots of the Fingers.

BURSÆ MUCOSÆ

OF

THE INFERIOR EXTREMITIES.

BURSÆ *upon the* PELVIS *and Upper Part of the* THIGH.

A VERY large Bursa between the Iliacus Internus and Psoas Magnus, and Capsular Ligament of the Thigh-bone. This is sometimes found communicating with the Cavity of the Joint, particularly in an old person.

A Bursa between the Tendon of the Pectinalis and Thigh-Bone, and sometimes,

A small Bursa between the Tendon of the Psoas Magnus, Iliacus Internus, and Trochanter Minor.

A small Bursa between the Gluteus Medius and Trochanter Major, and before the Insertion of the Tendon of the Pyriformis.

A Bursa between the Tendon of the Gluteus Minimus and Trochanter Major.

A small Bursa between the Obturator Internus, Geminus Inferior, and Gluteus Maximus.

A Bursa between the Gluteus Maximus and Vastus Externus.

A Bursa between the Gluteus Medius and Pyriformis.

A Bursa between the Obturator Internus and Os Ischium.

An oblong Bursa continued a considerable way between the Obturator Internus and Gemini, and Capsular Ligament of the Thigh-bone.

A small Bursa at the Head of the Semimembranosus and Biceps Flexor Cruris.

A small Bursa between the Origin of the Semitendinosus and that of the two former Muscles.

A large Bursa between the Tendon of the Gluteus Maximus and root of the Trochanter Major.

Two small Bursæ between the Tendon of the Gluteus Maximus and Thigh-bone.

BURSÆ *about the* JOINT *of the* KNEE.

A superficial Bursa frequently found between the Periosteum covering the fore part of the Patella, and the Tendinous Expansion over it.

A large Bursa behind the Tendon of the Extensors of the Leg. This, in young Subjects, is separated from the Cavity of the Joint by a thin Partition, consisting of the Capsular Ligament and the Bursa intimately connected; but in old people, it very frequently communicates with the Joint by a large Opening.

A Bursa behind the Ligament which joins the Patella to the Tibia, in the upper part of the Cavity of which a Fatty Substance projects.

A large Bursa between the Tendons of the Sartorius, Gracilis, Semitendinosus, and Tibia.

A Bursa between the Tendons of the Semimembranosus, Gastrocnemius Externus, and Ligament of the Knee. This Bursa contains a small one within it, from which there is a passage leading into the Cavity of the Joint.

A Bursa between the Tendon of the Semimembranosus and the internal Lateral Ligament of the Knee, from which also there is a passage leading into the Joint.

A Bursa under the Popliteus, likewise communicating with the Cavity of the Knee-joint.

BURSÆ *about the* ANKLE.

A Bursa between the Tendon of the Tibialis Anticus and under part of the Tibia and Ligament of the Ankle.

A Bursa between the Tendon of the Extensor Proprius Pollicis Pedis, and the Tibia, and Capsular Ligament of the Ankle.

A Bursa between the Tendons of the Extensor Digitorum Longus and Ligament of the Ankle.

A large Bursa common to the Tendons of the Peronei Muscles.

A Bursa proper to the Tendon of the Peroneus Brevis.

A Bursa between the Tendo ACHILLIS and Os Calcis, into the Cavity of which a *Peloton* of Fat projects.

A Bursa between the Os Calcis and Flexor Pollicis Longus.

A Bursa between the Flexor Digitorum Longus, and the Tibia and Os Calcis.

A Bursa between the Tendon of the Tibialis Posticus, and the Tibia and Astragalus.

BURSÆ *in the* SOLE *of the* FOOT.

A second Bursa for the Tendon of the Peroneus Longus, with an oblong *Peloton* of Fat within it.

A Bursa common to the Tendon of the Flexor Pollicis Longus, and that of the Flexor Digitorum Profundus, at the upper end of which a Fatty Substance projects.

A Bursa for the Tendon of the Tibialis Posticus.

A Bursa lining the Sheath of each of the Tendons of the Flexors upon the Toes.

OF THE

LIGAMENTS, &c.

OF THE

JOINTS.

LIGAMENTS are *white, strong, flexible* Substances, of an intermediate firmness between Cartilage and common Membrane.

They are *composed* of Fibres variously disposed; the greater part of them, however, running in a longitudinal direction.

The Ligaments of moveable Joints arise, for the most part, at the junction of the Bodies of the Bones with their Epiphyses, from the *Cervix*, and beyond the edges of the articulating Cartilage of one Bone, and are fixed, in a similar manner, into the corresponding parts of the Bone adjoining.

The Ligaments thus fixed are called *Capsular*, from their forming a *Purse* or *Bag*, which includes the Joint.

Where *variety of motion* is allowed, the Capsular Ligament is nearly of equal strength round the whole circumference of the Joint; but, where the Joint is of the nature of a *Hinge*, the Ligaments are strongest at the sides of that Hinge, or are there strengthened by the addition of Ligamentous Slips, termed *Lateral Ligaments*, which assist in regulating the motion of the Joints.

The *outer* part of the Capsular Ligament is formed of a continuation of the *Periosteum*, which is connected to the surrounding parts by Cellular Substance; while the *inner* Layer,—remarkably thin and dense,—is reflected over the Bones and Cartilages which the Ligament includes; one part of it thus forming *Periosteum*, and the other *Perichondrium*.

In certain parts of the Body, there are, besides the Ligaments mentioned above, others for the firm connection of the Bones, or for confining the motion to one particular side; as the *Round Ligament* of the Thigh, or *Crucial*, or *Lateral* Ligaments of the Knee, already mentioned.

Wherever the Ligaments are few, long, and weak, the motions are more extensive; and, on the contrary, where the Ligaments are numerous, short, and strong, the motions are more limited.

Ligaments have numerous *Blood-vessels*, which can be readily injected.

Upon the inner Surface of the Capsular Ligaments, their *Arteries* secrete a Liquor which assists in the lubrication of the Joints.

The *Nerves* of Ligaments are very minute, but in some parts can be easily traced upon their Surface.

The *Sensibility* of Ligaments, in the sound state, is inconsiderable; when in a state of inflammation, however, they are found to occasion extreme pain.

Use: The Capsular Ligaments connect Bones together, assist in the secretion of the Synovia which they contain, and prevent the other parts in the Joint from being pinched.

The other Ligaments join Bones together, and preserve them in their proper situation.

In many parts, the Ligaments give attachment to Tendons, and in some they supply the place of Bone, and give Origin to Muscles, as in the Foramina Thyroidea of the Pelvis, and between the Bones of the Fore-arms and Legs.

In some parts, they assist in connecting immoveable Bones, as at the *Os Sacrum* and *Os Innominatum:* In others, they form a Socket in which moveable Bones play, as where part of the *Astragalus* moves on the Ligament stretched between the *Os Calcis* and *Os Scaphoides.*

SYNOVIAL ORGANS,

Commonly called GLANDS *of the* JOINTS.

These are *Masses of Fat* found in the greater number of the Joints, covered with a continuation of the inner Layer of the Capsular Ligament, and projecting in such a manner as to be gently pressed, but not bruised, by the motions of the Joint; and, in proportion as these motions are more or less frequent, the liquor which they secrete is discharged in a greater or smaller quantity.

In some Joints, they have the same appearance with the common Fat of the Body; in others, they are of a redder colour, from the numerous Blood-vessels dispersed upon them.

They have been generally considered as *Glands* lodged within masses of Fat; but, upon a minute inspection, no knotty or Glandular Bodies are to be found in them; nor have they the appearance of Glands, farther than in being secreting Substances; which circumstance alone assimilates them to the nature of Glands.

From the edges of these Fatty Bodies, *Fimbriæ* hang loose, and convey a lubricating Liquor, called *Synovia*, into the Cavity of the Joints.

From the extremities of these *Fringes*, the Liquor can be readily squeezed out by pressure; but their Cavities and Orifices are so minute, or are otherwise of such a nature, as to have hitherto eluded discovery.

The Fimbriæ have been generally considered as *Excretory Ducts of Glands* within the Joints. DR MONRO, however, in his Work upon the Bursæ Mucosæ, supposes them to be of the nature of the *Follicles of the Urethra*, which prepare a Mucilaginous Liquor, without the assistance of any knotty or Glandular Organ.

The *Arteries* which supply these Bodies with Blood for their Secretion, and the *Veins* which return the Blood after the Secretion has been performed, can be readily seen; but no *Nerves* can be traced in them; nor does it appear that they possess a higher degree of Sensibility than the other parts of the Joints already described, although, when they inflame and suppurate, they have in some instances been observed to occasion the most excruciating pain.

The *Synovia*, which is a thin Mucilaginous Liquor, resembling the glair of an egg, appears to be furnished, not only by the Substances already mentioned, but also by the extremities of Arteries on the inner Surface of the Capsular Ligaments in general, and serves for the lubrication of the Joints; for which purpose it is well adapted, being remarkably slippery to the touch.

Synovia is found to be composed of Water, mixed with a small proportion of Gelatin, Mucilage, Albumen, and common Salt.

LIGAMENTS OF THE HEAD AND TRUNK.

Ligaments *of the* Lower Jaw.

The *Capsular Ligament* on each side, which arises from the whole Margin of the Articular Cavity of the Temporal Bone, and is inserted, first into the edge of the Interarticular Cartilage, formerly taken notice of, and afterwards round the Cervix of the Lower Jaw. This Ligament, like others which belong to Joints of the hinge kind, is thickest and strongest at the sides of the Joint, to confine the lateral motion of the Jaw.

By it the Jaw is allowed to move upwards, downwards, or a little forwards or backwards, or to either side; and the motions are rendered easier by the intervention of the Interarticular Cartilage, which follows the Condyle in its different motions.

The *Suspensory Ligament* of the Stylo-glossus, which is attached by one end to the Styloid Process, and to a Ligament running from that Process to the *Os Hyoides*, and by the other end to the Angle of the Lower Jaw;—serving to support the Stylo-glossus, and to give origin to part of it.

The *Lateral Ligament*, which arises from the Margin of the Articular Cavity of the Temporal Bone, and is inserted into the inner Surface of the Angle of the Lower Jaw, near its posterior Foramen;—assisting to keep the Jaw *in situ*, and to prevent the inferior Maxillary Vessels and Nerve from being injured by the action of the Pterygoid Muscle.

LIGAMENTS *connecting the* HEAD *with the First and Second* VERTEBRÆ *of the* NECK, *and these two* VERTEBRÆ *with each other.*

The *two Capsular Ligaments*, which arise from the margin of the superior articulating Processes of the Atlas, and are inserted into the Base of the Condyles of the Occipital Bone, where the Head has its flexion and extension without rotation.

The *Circular Ligament*, which arises from the edge of the Spinal Hole of the first Vertebra, is connected with the Capsular Ligaments of the superior articulating Processes of the Atlas, and is inserted into the edge of the Foramen Magnum of the Occipital Bone.

The two *Capsular Ligaments*, which fix the inferior oblique Processes of the Atlas to the superior oblique of the Vertebra Dentata, and admit of the rotation of the Head, with a small degree of flexion to either side.

The *Perpendicular Ligament*, which fixes the Processus Dentatus of the Second Vertebra to the edge of the anterior part of the Foramen Magnum, between the Condyloid Processes, and which is twisted in the rotation of the Head.

The *two Lateral*, or *Moderator Ligaments*, which arise each from the side of the Processus Dentatus, and run outwards and upwards, to be fixed to the inner part of the side of the Atlas, and to the inner edge of the Foramen Magnum at the fore part of the Condyles. They are short, but of great strength, and prevent the Head from turning too far round.

The *Transverse Ligament*, which arises from the inner side of the Atlas, and, going across behind the Processus Dentatus, is fixed to the opposite side of the Atlas.

The edges of this Ligament extend upwards and downwards, and form two Processes, called its *Appendices*, which are fixed to the Foramen Magnum and Processus Dentatus. The middle of the Ligament is remarkably firm where that Process plays upon it. It keeps the Processus Dentatus in its place, and prevents it from injuring the Spinal Marrow in the different motions of the Head.

In persons who suffer Death from Suspension by the Neck, this Ligament, and some of the others near it, are sometimes so much ruptured, as to allow a partial dislocation to take place, or the Processus Dentatus to be thrust back upon the Spinal Marrow; but this is not a common occurrence.

Ligaments *of the other* Vertebræ.

The *Anterior common Ligament* of the Vertebræ, which is a strong Tendinous Band, extending along the convex or outer part of the Vertebræ, from the upper to the under region of the Spine. It begins at the second Cervical Vertebra, and descends as far as the Os Sacrum, where it spreads out, becomes thinner, and vanishes about the under part of this Bone.

It is much thicker upon the fore part than on the sides of the Vertebræ, by which the Bones are more firmly united anteriorly, and is thinnest in the Neck and Loins, where the motions of the Spine are greatest. Internally it is blended with the Periosteum, and, through its whole course, it sends off small Processes to be fixed to the Bodies of the Vertebræ, by which their connection is made more secure. While it assists in binding the Vertebræ together, it prevents the Spine from being stretched too much backwards.

The *Crucial Intervertebral Ligaments*, which are numerous and short, but strong, situated behind the Ligamentum Commune Anterius, crossing each other obliquely. They join the Bodies of the Vertebræ together, upon the outer edges of the Intervertebral Substances, to which also they firmly adhere.

The *Intervertebral Substances*, (already described along with the Bones), which join the Bodies of the Vertebræ together, and allow an yielding motion in all directions.

These Substances are so compressible as to yield to the weight of the upper part of the Body; so that, after having been in an erect posture through the course of the day, the height of a person of middle stature, and in the prime of life, is diminished from half an inch to a inch in the evening, but, after a night's rest in the usual attitude, it is completely restored.

The *Ligaments* which run from the edge of the Bony Arch and Spinous Process of one Vertebra to that of the next, so as to assist in filling up the Interstices, and in fixing the Vertebræ together.

A *Ligamentous Cord* which fixes the points of the Spinous Processes together.

The *Cervical Ligament*, termed *Ligamentum Nuchæ*, vel *Colli*, which arises from the perpendicular Spine of the Occipital Bone, and descends on the back part of the Neck, adhering to the Spinous Processes of the Cervical Vertebræ, and giving origin to part of the Trapezius.

Ligaments between the Transverse Processes of the Vertebræ of the Back, fixing these Processes to each other.

The *Capsular Ligaments*, which join the articulating Processes to each other.

The *Posterior* or *Internal Common Ligament* of the Vertebræ, somewhat similar to the anterior one.

It begins at the anterior edge of the Foramen Magnum, and passes along the inner or concave part of the Bodies of the Vertebræ, becoming broader over each of the Intervertebral Substances. It adheres firmly to their upper and under edges, and terminates at the lower part of the Os Sacrum. It prevents the Spine from being too much bent forwards.

LIGAMENTS *of the* RIBS.

The *Capsular Ligaments of the Heads of the Ribs*, which arise from these Heads, and are fixed to the Circumference of the Pits in the sides of the Bodies of the Vertebræ and Intervertebral Cartilages. The outer part of each Ligament sends off, or is connected with, radiated Fibres which are spread out upon the sides of the Vertebræ.

The *Capsular Ligaments of the Tubercles of the Ribs*, which arise round the Articular Pits on the points of the Transverse Processes of the Vertebræ of the Back, and are fixed round the Tubercles of the Ribs.

The *Internal Ligaments of the back of the Ribs*, called *Ligamenta Transversaria Interna*, which arise from the inferior Surfaces of the Transverse Processes, and are fixed to the superior Margins of the Necks of the nearest Ribs.

The *External Ligaments of the Necks of the Ribs*, called *Ligamenta Transversaria Externa*. They arise from the points of the Transverse Processes externally, and are fixed to the back part of the Necks of the Ribs.

Ligamenta Cervicis Costarum Externa, or *External Ligaments of the Necks of the Ribs*, which arise from the External Margins of the inferior oblique Processes, and descend obliquely outwards, to be fixed to the upper and outer part of the Necks of all the Ribs.

The

The Ligaments at this end of the Ribs, together with the situation of the Transverse Processes, admit of their motion upwards and downwards, but prevent them from moving in any other direction.

Short Ligamentous Fibres, which run from the Margins of the anterior extremities of the Ribs to the Margins of their corresponding Cartilages; the Cartilages and Ribs, which these Fibres inclose, being joined by a union of Substance.

Radiated Ligaments, which go from the Sternal extremities of the Cartilages of the Ribs, over the external Surface of the Sternum.

Many of the Fibres of these Ligaments intermix with their fellows on the opposite side.

The *Capsular Ligaments of the Cartilages of the Ribs,* which arise from the Margins of the Articular Cavities of the Sternum, within the Radiated Ligaments, and are fixed round the extremities of the Cartilages of the seven True Ribs. Within the Capsular Ligaments, the concave part of the Pits on the edges of the Sternum are connected to the ends of the Cartilages of the Ribs, by fine Cellular Substance, which allows the Cartilages to roll upon the Sternum.

The *Membrane proper to the Sternum,* which is a firm Expansion, composed of Tendinous Fibres running in different directions, but chiefly in a longitudinal one, and covering the anterior and posterior Surfaces of the Bone, the Membrane itself being confounded with the Periosteum.

Ligaments of the Cartilago Ensiformis, which are part of the proper Membrane of the Sternum, divided into strong Bands running obliquely from the under and fore part of the second Bone of the Sternum, and from the Cartilages of the seventh Pair of Ribs, to be fixed to the Cartilago Ensiformis.—The Ligaments covering the Sternum serve considerably to strengthen it.

Thin Tendinous Expansions, which run over the Intercostales at the fore part of the Thorax, and connect the Cartilages of the Ribs to each other. They are chiefly seated in the spaces unoccupied by the Intercostales Externi.

LIGAMENTS

OF THE

BONES OF THE PELVIS.

THE *two Transverse Ligaments of the Pelvis,* which arise from the posterior part of the Spine of the Os Ilium, and run transversely. The one is *superior,* and is fixed to the Transverse Process of the last Vertebra of the Loins; the other *inferior,* and is connected to the first Transverse Process of the Os Sacrum.

The *Ilio-sacral Ligaments,* which arise from the posterior Spinous Process of the Os Ilium, descend obliquely, and are fixed to the first, third, and fourth spurious Transverse Processes of the Os Sacrum.

These, with the two Transverse Ligaments, assist in binding the Bones together to which they are connected.

The *Capsular Ligament of the Symphysis of the Os Ilium and Sacrum,* which surrounds the Joint, and assists in connecting the two Bones to each other.

A *very thin Cartilage* within this Joint, which cements the two Bones strongly together, and which constantly adheres to the Os Sacrum when the Joint is opened.

A *Ligamentous* and *Cellular Substance*, containing *Mucus*, which forms the back part of this Joint, also assisting to fix the two Bones to each other, in such a manner as to allow no motion; the Joint, however, along with its fellow, and that between the Ossa Pubis, being useful in diminishing the effects which might result from concussion.

The *two Sacro-ischiatic Ligaments*, situated in the under and back part of the Pelvis. They arise in common from the Transverse Processes of the Os Sacrum, from the under and lateral part of that Bone, and from the upper part of the Os Coccygis.

The first of these Ligaments, called the *Large*, *External*, or *Posterior Sacro-ischiatic Ligament*, descends obliquely to be fixed to the Tuberosity of the Os Ischium. The other, called the *Small*, *Internal*, or *Anterior Sacro-ischiatic Ligament*, runs transversely to be fixed to the Spinous Process of the Os Ischium.

These two Ligaments assist in binding the Bones of the Pelvis, in supporting its contents, and in giving Origin to part of its Muscles. By the External, the Notch of the Ilium is formed into a Hole for the passage of the Pyriform Muscle, the Sciatic Nerve, and the Blood-vessels which belong to the outside of the Pelvis. Between the two Sacro-sciatic Ligaments, an Opening is left for the passage of the Obturator Internus.

The *two Membranous Productions* which are connected with the large Sacro-ischiatic Ligament, termed by Weitbrecht the *Superior* and *Inferior Appendices* of the large Sacro-ischiatic Ligament.

The *Superior Appendix*, which is Tendinous, arises from the back part of the Spine of the Os Ilium, and is fixed along the outer edge of the Ligament, which it increases in breadth.

The *Inferior* or *Falciform Appendix* is situated within the Cavity of the Pelvis; the back part of it is connected with the middle of the large External Ligament, and the remainder is extended round the Curvature of the Os Ischium.

These two Productions assist the large Sacro-ischiatic Ligament in furnishing a more commodious situation for, and attachment to, part of the Gluteus Maximus and Obturator Internus.

Besides the Ilio-sacral, and Sacro-ischiatic Ligaments, several other *Slips* are observed upon the back of the Os Sacrum, which descend in an irregular manner, and strengthen the connection between that Bone and the Ossa Ilia.

The large Holes upon the back part of the Os Sacrum are also surrounded with various *Ligamentous Expansions* projecting from one Tubercle to another, and giving Origin to Muscular Fibres, and protection to small Vessels and Nerves which creep under them.

A *General Covering* sent down from the Ligaments of the Os Sacrum, which spreads over and connects the different pieces of the Os Coccygis together, allowing considerable motion, as already mentioned in the description of this Bone.

Longitudinal Ligaments of the Os Coccygis, which descend from those upon the Dorsum of the Os Sacrum, to be fixed to the back part of the Os Coccygis. The Ligaments of this Bone prevent it from being pulled too much forwards by the action of the Coccygeus; and they restore the Bone to its natural situation, after that Muscle has ceased to act.

The *Inguinal*, or POUPART's, or FALLOPIUS's *Ligament*, or *Crural Arch*, which runs transversely from the anterior-superior Spinous Process of the Os Ilium to the Crest or Angle of the Os Pubis. It has been already described as the inferior Margin of the Tendon of the External Oblique Muscle of the Abdomen.

A strong Ligamentous Tendon covering the upper part of the Os Pubis, projecting above the Linea Ilio-pectinea, and having part of the Ligament of POUPART fixed to it.

The *Capsular Ligament of the Symphysis of the Ossa Pubis*, which joins the two Bones to each other externally.

The *Ligamentous Cartilage*, which unites the two Ossa Pubis so firmly together as to admit of no motion, excepting in the state of Pregnancy, when it is frequently found to be so much thickened, as to be capable of yielding a little in the time of Delivery.

The *Obturator Membrane*, or *Ligament of the Foramen Thyroideum*, which adheres to the Margin of the Foramen Thyroideum, and fills the whole of that Opening, excepting the Oblique Notch at its upper part for the passage of the Obturator Vessels and Nerve. It assists in supporting the contents of the Pelvis, and in giving Origin to the Obturatores. By yielding a little in the time of Labour, it contributes in a small degree to an easier Delivery.

LIGAMENTS

LIGAMENTS

OF

THE SUPERIOR EXTREMITIES.

LIGAMENTS *of the* CLAVICLE.

THE *Radiated Ligaments*, which arise from the outer Surface of the inner end of the Clavicle, and are fixed round the edge of the corresponding Articular Cavity of the Sternum.

The *Capsular Ligament*, which lies within the former.

The *Inter-articular Cartilage*, which divides the Joint into two distinct Cavities, and accommodates the articulating Surfaces of the Clavicle and Sternum.

The *Inter-clavicular Ligament*, joining the Clavicles together behind the top of the Sternum, and partly formed by a continuation of the Radiated Ligaments.

By the Ligaments of this Joint, with the assistance of the intervening Cartilage, the Shoulder is allowed to move in different directions, as upon a centre.

The *Ligamentum Rhomboideum*, which arises from the inferior rough Surface at the anterior extremity of the Clavicle, and is fixed to the Cartilage of the first Rib.

The *Ligaments* which join the posterior extremity of the Clavicle to the Acromion, having a Capsular Ligament within, and sometimes an Inter-articular Cartilage.

The *Ligamentum Conoideum*, which arises from the root of the Coracoid Process, and is fixed to the Tubercle at the outer end of the Clavicle.

The *Ligamentum Trapezoideum*, which arises from the point of the Coracoid Process, and is fixed to the under edge of the Clavicle.

A *thin Ligamentous Slip* which comes from the Tendon of the Subclavius, or from the Clavicle, and joins the Trapezoid Ligament.

The Ligaments fixing the Clavicle to the Scapula are of such strength, as to allow only a small degree of motion, and that chiefly of a rolling or twisting nature.

LIGAMENTS *proper to the* SCAPULA.

The *Proper Anterior Triangular Ligament of the Scapula*, which arises broad from the External Surface of the Coracoid Process, and becomes narrower where it is fixed to the posterior Margin of the Acromion.

This Ligament forms one continued Surface. It is thickest, however, on each side, and these thicker parts are united by a thin intermediate Ligamentous Membrane, which, when removed, gives to the Ligament the appearance of being double. It confines the Tendon of the Supra-spinatus, and assists in protecting the upper and inner part of the Joint of the Humerus.

The *Proper Posterior Ligament of the Scapula,* which is sometimes double, and is stretched across the Semilunar Notch of the Scapula, forming that Notch into one or two Holes for the passage of the superior-posterior Scapulary Vessels and Nerve.

LIGAMENTS, &c. *of the* JOINT *of the* SHOULDER.

The *Capsular Ligament,* which arises from the Cervix of the Scapula, behind the Margin of the Glenoid Cavity, and is fixed round the Neck of the Os Humeri, loosely inclosing the Ball of that Bone.

A *small Fimbriated Organ* within the Capsular Ligament, for the Secretion of part of the Synovia.

A *Sheath* sent down from the fore part of the Capsular Ligament, between the Tuberosities of the Os Humeri, which incloses the Tendon of the long Head of the Biceps Flexor Cubiti, and prevents it from starting out of its place.

Additional Ligamentous Bands of the Capsular Ligament, which adhere to its anterior Surface. What gives most strength to this Joint, as well as to several other Joints of the Body, is the covering from the surrounding Muscles.

From the shallowness of the Glenoid Cavity, from the extent and looseness of the Capsular Ligament, and from the Structure of the other parts of the Joint, more extensive motion is allowed to the Os Humeri than to any other Bone of the Body; as it can not only move freely to every side, but also possesses a considerable degree of motion upon its own axis.

LIGAMENTS, &c. *of the* JOINT *of the* ELBOW.

The *Capsular Ligament*, which arises round the Margin of the Articular Surface, at the lower end of the Os Humeri, and is fixed about the edge of the Articular Surface of the Ulna, and also to the Coronary Ligament of the Radius.

The sides of the Elbow-Joint are strengthened by *two Ligamentous Bands*, which adhere so firmly to the outer Surface of the Capsular Ligament, that they appear to be part of its Substance, viz.

The *Brachio-Ulnar*, or *Internal Lateral Ligament*, which arises from the fore part of the inner Condyle of the Os Humeri, and spreads out, in a radiated manner, to be fixed to the inside of the Coronoid Process of the Ulna.

The *Brachio-Radial*, or *External Lateral Ligament*, which is like the former, but larger. It arises from the External Condyle of the Os Humeri, and is expanded upon the Coronary Ligament, into which it is inserted.

The *Coronary*, *Annular*, or *Orbicular Ligament* of the *Radius*, which approaches to the firmness of Cartilage. It arises from one side of the small Semilunar Cavity of the Ulna, and after surrounding the Neck of the Radius, is fixed to the other side of that Cavity. The upper edge of it is incorporated with, and may be considered as a part of the Capsular Ligament, while its under edge is fixed round the Neck of the Radius, allowing that Bone to move freely round its own axis, upon the

Articular Surface of the Os Humeri, and in the small Semilunar Cavity of the Ulna.

Besides the Ligaments already described, there are others which run in various directions upon the fore and back parts of the Joint, contributing to its strength, and having the names of *Anterior* and *Posterior Accessory Ligaments.*

There are also two Tendinous Substances, termed *Inter-muscular Ligaments of the Os Humeri*, which extend along the under and lateral parts of the Bone, giving origin to part of the Muscles situated at this part of the Arm.

The Ligaments and Bones of the Joint of the Elbow form a complete Hinge, which allows the Fore-arm to have free flexion and extension upon the Os Humeri, but no rotation when the Arm is in the extended state, though a small degree of it is perceptible when the Joint is moderately bent, and the Ligaments thereby relaxed.

Within the Capsular Ligament, and chiefly in the upper part of the Pit of the Os Humeri in which the Olecranon plays, the *Fatty Substance* is lodged for the lubrication of the Joint.

A *similar Substance*, but much smaller, is also found in the Depression in which the Coronoid Process of the Ulna moves.

LIGAMENTS *between the Bodies, and between the Under Ends of the* RADIUS *and* ULNA.

The *Interosseous Ligament*, which extends between the sharp Ridges of the Radius and Ulna, filling up the greater part of the space between these two Bones. It is broadest in the middle, in consequence of the Bones here being largest at their extremities, and is composed of small *Fasciculi*, which run obliquely downwards and inwards. Two or three of these Slips, however, go in the opposite direction; and one of them, termed *Oblique Ligament*, and *Chorda Transversalis Cubiti*, is stretched between the Tubercle of the Ulna and under part of the Tubercle of the Radius.

In different parts of the Interosseous Ligament, there are Perforations for the passage of Blood-vessels from the fore to the back part of the Fore-arm, and a large Opening is found at the upper edge of it, which is occupied by Muscles.

This Ligament assists in binding the Ulna and Radius together, prevents the Radius from rolling too much outwards, and furnishes a commodious attachment for Muscles.

The *Capsular*, or *Sacciform Ligament*, which arises from the edges of the Semilunar Cavity at the under end of the Radius, and surrounds the Head of the Ulna, allowing the Radius to turn upon the Ulna, in performing the different motions of Pronation and Supination of the Hand.

Ligaments, &c. *between the* Fore-arm *and* Wrist.

The *Capsular Ligament*, which arises from the Margin of the Glenoid or Navicular Cavity of the Radius, and from the edge of the moveable Cartilage at the Head of the Ulna, and is fixed to the Cartilaginous edges of the three first Bones of the Carpus.

The *Inter-articular Cartilage*, placed between the Head of the Ulna and Os Cuneiforme, and which is a continuation of the Cartilage covering the end of the Radius. It is concave above and below, and is connected loosely to the end of the Styloid Process of the Ulna.

The *Two Lateral Ligaments*, one of which arises from the Styloid Process at the under end of the Radius, and is fixed to the Os Naviculare; and the other from the Styloid Process of the Ulna, and is fixed to the Cuneiform and Pisiform Bones.

The Ligaments of this Joint allow extensive motion forwards and backwards, and a considerable degree of it to either side.

The *Mucous Ligament*, which lies within the Joint, and extends from the Groove between the two first Bones of the Carpus, to the corresponding part of the Radius. It is supposed to regulate the Mucous Organ connected with it.

LIGAMENTS *of the* CARPUS.

The *Anterior*, *Annular*, or *Transverse Ligament*, which is stretched across from the projecting Points of the Ossa Pisiforme and Unciforme, to the Scaphoides and Trapezium, and forms an Arch which covers and preserves in their places the Tendons of the Flexor Muscles of the Fingers.

The *CapsularLigament*, which arises from the Cartilaginous Edge of the upper Row of the Carpus, and is fixed in a similar manner to that of the under Row, chiefly admitting of flexion and extension, and that in a smaller degree than in the former Joint.

The *Short Ligaments* of the Bones of the Carpus, which are *small Slips* running in various directions, joining the different Bones of the Carpus,—first of the same Row, then of the two Rows together. They are termed *Oblique*, *Transverse*, *Capsular*, and *Proper* Ligaments of the Bones of the Wrist, and admit only of a small degree of yielding between the different Bones in the same Row.

LIGAMENTS *between the* CARPAL *and* METACARPAL BONES.

The *Articular Ligaments*, which arise from the Margins of the second Row of the Carpal Bones, and are fixed to the Margins of the adjoining Bones of the Metacarpus. *Other Ligaments* run in a radiated manner from the Carpal to the Metacarpal Bones; the whole getting the names of *Articular*, *Lateral*, *Straight*, *Perpendicular*, &c. according to their different directions.

From the flatness of the Articular Surfaces, and strength of the connecting Ligaments, very little motion is allowed between the Carpus and Metacarpus.

LIGAMENTS *between the Extremities of the* METACARPAL BONES.

The *Interosseous Ligaments* at the *Bases* of the Metacarpal Bones. They are short Slips, which run transversely, and join these Bones to each other, obtaining the names of *Dorsal*, *Lateral*, or *Palmar*, according to their different situations.

The *Interosseous Ligaments* at the *Heads* of the Metacarpal Bones, which run transversely in the Palm, and connect the Heads of these Bones to each other.

LIGAMENTS *at the Base of the* METACARPAL BONE *of the* THUMB, *and at the First* JOINT *of the* FINGERS.

These consist of the *Capsular Ligaments*, which inclose the Joints, and the *Lateral Ligaments*, which are situated at the sides of the Joints, adhering to and strengthening them; the whole admitting of flexion, extension, and lateral motion.

LIGAMENTS *of the First and Second* JOINTS *of the* THUMB, *and Second and Third* JOINTS *of the* FINGERS.

The *Capsular Ligaments* inclosing the Joints.

The *Lateral Ligaments* placed at the sides of the Joints, and adhering to the Capsular Ligaments, confining the motion to flexion and extension.

LIGAMENTS *retaining the* TENDONS *of the* MUSCLES *of the* HAND *and* FINGERS *in situ.*

The *Anterior*, *Transverse*, or *Annular Ligament* of the Wrist,—already described.

The *Vaginal Ligaments of the Flexor Tendons*, which are fine Membranous Webs connecting the Tendons of the Sublimis, first to each other, then to those of the Profundus, and forming, at the same time, Bursæ Mucosæ, which surround these Tendons.

The *Vaginal* or *Crucial Ligaments of the Phalanges*, which arise from the Ridges on the concave side of the Phalanges, and run over the Tendons of the Flexor Muscles of the Fingers. Upon the Body of the Phalanges, they are thick and strong, to bind down the Tendons while their Muscles are in action; but over the Joints they are thin, and have, in some parts, a Crucial appearance, to allow the ready motion of the Joints.

The *Accessory Ligaments of the Flexor Tendons of the Fingers*, which are *small Tendinous Fræna*, arising from the first and second Phalanges of the Fingers. They run obliquely forwards within the Vaginal Ligaments, terminate in the Tendons of the Two Flexor Muscles of the Fingers, and assist in keeping them in their places.

The *External Transverse*, or *Posterior Annular Ligament of the Wrist*, which is part of the Aponeurosis of the Fore-arm, extending across the back of the Wrist, from the inner side of the extremity of the Ulna and Os Pisiforme to the outer side of the extremity of the Radius. It is connected with the small Annular Ligaments which tie down the Tendons of the Extensores Ossis Metacarpi et Primi Internodii Pollicis, and the Extensor Carpi Ulnaris,

The *Vaginal Ligaments,* which adhere to the former Ligaments, and serve as sheaths and Bursæ Mucosæ to the Extensor Tendons of the Hand and Fingers.

The *Transverse Ligaments* of the Extensor Tendons, which are Aponeurotic Slips running between the Tendons of the Extensor Digitorum Communis, near the Heads of the Metacarpal Bones, and retaining the Tendons in their places.

LIGAMENTS

OF

THE INFERIOR EXTREMITIES.

Ligaments, &c. *connecting the* Os Femoris *with the* Os Innominatum.

The *Capsular Ligament*, the largest and strongest of the Articular Ligaments. It arises round the outside of the Brim of the Acetabulum, embraces the Head of the Thigh-bone, and incloses the whole of its Cervix as far as the root or outer extremity, round which it is firmly connected.

The *outer part* of the Capsular Ligament is extended farther down than the *inner*, which is reflected back upon the Neck of the Bone, and in certain parts forms *Retinacula.*

It is not every where of the same strength. It is thickest at its anterior and outer part; thinner where it is covered by the Iliacus Internus; and thinnest posteriorly, where the adjacent Quadratus is opposed to it.

It is strengthened on its outer Surface by various *Accessory* or *Additional Slips*, which run down from the Fascia Lata and surrounding Muscles; but the strongest of these Slips arises with diverging Fibres from the inferior-anterior Spinous Process of the Os Ilium.

The Capsular Ligament allows the Thigh-bone to be moved to every side; and when its Body is moved forwards or backwards, a small degree of rotation is performed by the Cervix of the Bone, round its own axis.

The *Internal*, commonly called the *Round Ligament*, which arises by a broad flat beginning from the under and inner part of the Cavity of the Acetabulum, and is connected with the Substance termed *Gland of the Joint*. From this it runs backwards and a little upwards, becoming gradually narrower and rounder, to be fixed to the Pit upon the inner Surface of the Ball of the Os Femoris.

The Round Ligament prevents the Bone from being dislocated upwards or inwards, and assists in agitating the Mucous Substance within the Joint.

A *Cartilaginous Ligament* surrounding the Brim of the Acetabulum, and thereby increasing the depth of that Cavity for the reception of the Head of the Thigh-bone.

A *Double Cartilaginous Ligament*, stretched from one end of the Breach in the under and fore part of the Acetabulum to the other, but leaving a Hole behind it for containing part of the Substance called *Gland of the Joint*, and for the passage of the Vessels of that Substance.

This Ligament allows the Thigh-bone to be moved inwards, and the Glandular-looking Substance to be agitated with safety.

The Substance called *Gland of the Joint*, covered with a Vascular Membrane, and lodged in a Depression in the under and inner part of the Acetabulum.

At the edges of this Substance *Fringes* are sent out, which furnish part of the Synovia for the lubrication of the Joint.

The edges of this Substance are fixed to those of the Pit in the Acetabulum, by small Ligamentous Bridles, termed *Ligamenta Mucosa*, vel *Ligamentula Massæ Adiposo-glandulosæ*.

LIGAMENTS, &c. *of the* JOINT *of the* KNEE.

The *Lateral Ligaments* which lie at the sides of the Joint, and adhere to the outer Surface of the Capsular Ligament.

The *Internal Lateral Ligament*, which is of considerable breadth, arising from the upper part and Tubercle of the internal Condyle of the Os Femoris, and inserted into the upper and inner part of the Tibia; the Fibres passing obliquely forwards, till they have reached a little below the Head of the Bone.

The *Long External Lateral Ligament*, which is narrower, but thicker and stronger than the former, arising from the Tubercle above the external Condyle of the Os Femoris, and fixed to the Fibula, a little below its Head.

Behind the long external Lateral Ligament, there is an *Expansion* attached nearly in the same manner as this Ligament, which has been termed the *External Short Lateral Ligament.*

These Ligaments prevent the lateral and rotatory motions of the Leg in the extended state, but admit of a small degree of both when the Limb is bent.

The *Posterior Ligament* of Winslow, formed of irregular Bands, which arise from the upper and back part of the external Condyle of the Os Femoris, and descend obliquely over the Capsular Ligament, to be fixed to the Tibia under the inner and back part of its Head. It prevents the Leg from being pulled farther forwards than to a straight line with the Thigh, and also furnishes a convenient situation for the beginnings of the Gastrocnemius and Plantaris Muscles.

When this Ligament is wanting, which is sometimes the case, its place is supplied by a *Membranous Expansion.*

The *Ligament of the Patella,* which arises from a Depression behind the Apex of that Bone, and is fixed to the Tuberosity of the upper and fore part of the Tibia. By the intervention of this Ligament, the Muscles inserted into the Patella are enabled to extend the Leg.

The *Capsular Ligament,* which arises from the whole Circumference of the under end of the Thigh-bone, some way above the Margin of the Articulating Cartilage, and above the posterior part of the great Notch between the Condyles. From this it descends to be fixed round the Head of the Tibia, and into the whole Margin of the Articulating Surface of the Patella, in such a manner that the Patella forms part of the Capsule of the Joint.

The Capsular Ligament is of itself remarkably thin, but so covered by the Ligaments already mentioned, by the general Aponeurosis of the Limb, and by the Tendons of Muscles which surround the Joint, as to acquire a considerable degree of strength.

The Capsular, with the other Ligaments of this Joint, admit of the flexion and extension of the Leg, but of no lateral nor rotatory motion in the extended state, though of a small degree of each when the Limb is fully bent.

The *Ligamentum Alare, Majus et Minus*, which are Folds of the Capsular Ligament, running like *Wings* at the sides of the Patella, to which, and to the Fatty Substance of the Joint, they are attached.

The *Ligamentum Mucosum*, continued from the joining of the Ligamenta Alaria to the Os Femoris, immediately above the Anterior Crucial Ligament. It preserves the Synovial Substance in its proper place, during the various motions of the Joint.

The *two Crucial* or *Internal Ligaments*, which arise from the Semilunar Notch between the Condyles of the Os Femoris, and decussate each other within the Cavity of the Joint.

The *Anterior Crucial Ligament* runs downwards and forwards, to be fixed to a Pit before the rough Protuberance in the middle of the Articulating Surface of the Head of the Tibia.

The *Posterior Crucial Ligament*, descends to be fixed to a Pit behind the above-mentioned rough Protuberance.

These Ligaments, in the extended state of the Leg, prevent it from going forward beyond a straight line with the Thigh. When the Knee is bent, they allow the Foot to be turned outwards, but not in a contrary direction.

The *two Inter-articular Cartilages*, called *Semilunar*, from their shape like a Crescent, placed upon the top of the Tibia.

The outer convex edge of each of these Cartilages is thick, while the inner concave edge becomes thin and sharp like a knife or sickle; and being concave above, the Sockets for the Condyles of the Os Femoris are rendered deeper, and this Bone and the Tibia are more accurately adapted to each other.

Each of these Cartilages is broad in the middle, their extremities becoming narrower and thinner as they approach one another. Each covers about two thirds of the Superficial Cavity of the top of the Tibia, leaving one third bare in the middle. The extremities are termed *Cornua*, and are fixed by Ligaments to the Protuberance of the Tibia. The anterior Cornua are joined to each other by a *Transverse Ligament*.

The convex edge of these Cartilages is fixed to the Capsular and other Ligaments, in such a manner as to be allowed to play a little upon the Cartilaginous Surface of the Tibia, by which the motions of that Bone upon the Condyles of the Os Femoris are facilitated.

The *Mucous* or *Fatty Substances* of this Joint, which are the largest of any in the Body, are situated in the different interstices of the Joint, but chiefly round the edges of the Patella. They are covered by a fine Membrane reflected from the inner Surface of the Capsular Ligament.

Fimbriæ project from the edges of these Fatty Substances, which discharge Synovia for the lubrication of the Joint.

Ligaments *connecting the* Fibula *to the* Tibia.

The *Capsular Ligament* of the superior extremity of the Fibula, which ties it to the outer part of the Head of the Tibia, and which is strengthened by the external Lateral Ligament of the Knee, and by the Tendon of the Biceps which is fixed to the Fibula.

The *Interosseous Ligament*, one edge of which is fixed to the Ridge or Angle at the outer and back part of the Tibia, the other to the corresponding Ridge at the inner side of the Fibula. It fills the space between the Tibia and Fibula, like the Interosseous Ligament of the Fore-arm, and is of a similar structure, being formed of oblique Fibres, and perforated in various places for the passage of Vessels and Nerves.

At its upper part there is a large Opening, where the Muscles of the opposite sides are in contact, and where Blood-vessels pass to the fore part of the Leg.

It serves chiefly for the Origin of part of the Muscles which belong to the Foot, and thereby supplies the place of Bone.

The *Ligaments* of the ~~inferior~~ superior extremity of the Fibula, which are called *Anterior-Superior*, and *Posterior-Superior*, according to their situations, arising from the edges of the Semilunar Cavity of the Tibia, and fixed to the Malleolus Externus of the Fibula.

The Ligaments between the ends of the Tibia and Fibula join the two Bones so firmly together, as to admit of no sensible motion.

LIGAMENTS *connecting the* BONES *of the* TARSUS *with those of the* LEG.

The *Anterior Ligament of the Fibula*, which arises from the anterior part of the Malleolus Externus, and passes obliquely forwards, to be fixed to the upper and outer part of the Astragalus.

The *Middle*, or *Perpendicular Ligament* of the Fibula, which arises from the point of the Malleolus Externus, and descends almost perpendicularly, to be inserted into the outside of the Os Calcis.

The *Posterior Ligament* of the Fibula, which arises from the under and back part of the Malleolus Externus, and runs backwards, to be joined to the outer and posterior part of the Astragalus.

The *Ligamentum Deltoides* of the Tibia, which arises from the Malleolus Internus, and descends in a radiated form, to be attached to the Astragalus, Os Calcis, and Os Naviculare.

The *Capsular Ligament*, which lies within the former Ligaments, and is remarkably thin, especially before and behind, for the readier motion of the Joint. It arises from the Margin of the Articular Cavity of the Tibia and Fibula, and is fixed round the edge of the Articular Surface of the Astragalus.

The Ligament and the other constituent parts of the Ankle-joint form it into a complete Hinge, which allows flexion and extension, but no rotation nor lateral motion in the bended state of the Foot, though a small degree of each when it is fully extended.

LIGAMENTS *of the* TARSUS.

The *Capsular Ligament*, which joins the Articular Surface of the Os Calcis to that of the Astragalus.

A number of *Short Ligaments*, lying in the Fossa of the Astragalus and of the Os Calcis, and forming the *Ligamentous Apparatus* of the Sinuous Cavity, which assists in fixing the two Bones strongly together.

The *Capsular*, the *Broad Superior*, and the *Internal Lateral Ligaments*, connecting the Astragalus to the Os Naviculare, and admitting of the lateral and rotatory motions of the Foot.

The *Superior*, the *Lateral*, and the *Inferior Ligaments*, fixing the Os Calcis to the Os Cuboides, where a small degree of motion is allowed to every side. The inferior Ligaments consist of a *Long*, an *Oblique*, and a *Rhomboid Ligament*, which are the longest and strongest of the Sole.

The *Superior Superficial*, the *Interossseous*, and the *Inferior Transverse Ligaments*, which fix the Os Naviculare and Os Cuboides to each other.

The *Superior Lateral*, and the *Plantar Ligaments*, which fix the Os Naviculare to the Os Cuneiforme.

The *Superior Superficial*, and the *Plantar Ligaments*, which connect the Os Cuboides to the Os Cuneiforme Externum.

The *Dorsal* and the *Plantar Ligaments*, which unite the Ossa Cuneiformia to each other.

Besides the Capsular Ligaments of the Tarsus already mentioned, each of the other Joints of these Bones is furnished with its *proper Capsular Ligament.*

From the strength of the Ligaments which unite these Bones to each other, and from the plainness of their Articulating Surfaces, no more motion is allowed than to prevent the effects of concussion in walking, leaping, &c.

LIGAMENTS *between the* TARSUS *and* METATARSUS.

The Bones of the Metatarsus are fixed to those of the Tarsus by *Capsular*, and numerous other *Ligaments*, which are called *Dorsal*, *Plantar*, and *Lateral*, according to their situations;—and *Straight Oblique* or *Transverse*, according to their directions. The nature of this Joint is the same with that between the Carpus and Metacarpus.

LIGAMENTS *connecting the* METATARSAL BONES *to each other.*

The *Dorsal*, *Plantar*, and *Lateral Ligaments*, which connect the Bases of the Metatarsal Bones with each other.

The *Transverse Ligaments*, which join the Heads of these Bones together.

LIGAMENTS *of the* PHALANGES *of the* TOES.

The *Capsular* and *Lateral Ligaments;*—resembling those of the Fingers.

LIGAMENTS *and* SHEATHS *retaining the* TENDONS *of the* MUSCLES *of the* FOOT *and* TOES, *in situ.*

The *Annular Ligament* of the Tarsus, which is a thickened part of the Aponeurosis of the Leg, splitting into superior and inferior portions, which bind down the Tendons of the Extensors of the Toes upon the fore part of the Ankle.

The *Vaginal Ligament of the Tendons of the Peronei*, which, behind the Ankle, is common to both, but at the outer part of the Foot forms a Sheath for each Tendon, preserving it in its proper place, and forming the *Bursa* of that Tendon.

The *Laciniated Ligament*, which arises from the inner Ankle, and spreads in a radiated manner, to be fixed, partly in the Cellular Substance and Fat, and partly to the Os Calcis, at the inner side of the Heel. It incloses the Tibialis Posticus and Flexor Digitorum Longus.

The *Vaginal Ligament of the Tendon of the Extensor Proprius Pollicis*, which runs in a Crucial direction.

The *Vaginal Ligament of the Tendon of the Flexor Longus Pollicis*, which surrounds this Tendon in the hollow of the Os Calcis.

The *Vaginal and Crucial Ligaments of the Tendons* *of the Flexors of the Toes,* which inclose these Tendons on the Surfaces of the Phalanges, and form their Bursæ Mucosæ.

The *Accessory Ligaments of the Flexor Tendons of the Toes,* which, as in the Fingers, arise from the Phalanges, and are included in the Sheaths of the Tendons in which they terminate.

The *Transverse Ligaments of the Extensor Tendons,* which run between these Tendons, and preserve them in their places behind the roots of the Toes.

END OF VOLUME FIRST.

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TABLE I.

REPRESENTS a Front View of the MALE SKELETON, with some of the CARTILAGES and LIGAMENTS which connect the BONES to each other.

HEAD *and* NECK.

A, The frontal bone.
B, The parietal bone.
C, Temporal process of the sphenoid bone.
D, Squamous part of the temporal bone.
E, Mastoid process of that bone.
F, The malar, or cheek-bone.
G, The nasal bone, behind which is the nasal process of,
H, The superior maxillary bone.
I, The lower jaw.
K, The cervical vertebræ, with their intermediate cartilages and transverse processes.

TRUNK.

A, The sternum.
B, The seventh, or last true rib.
C, The cartilages of the ribs.
D, The twelfth, or last false rib.
E, The lumbar vertebræ, with their intervertebral cartilages and transverse processes.
F, The os sacrum.
G, The os innominatum, composed of,
a, The os ilium,
b, The os pubis, and,
c, The os ischium.

UPPER EXTREMITY.

A, The clavicle.
B, The inner surface of the scapula.
a, The acromion of the scapula.
b, The coracoid process of that bone.
C, The os humeri.
c, The head, or ball of the os humeri, articulated with the glenoid cavity of the scapula.
d, Internal tubercle of the os humeri, and farther out, the groove for lodging the tendon of the long head of the biceps muscle.
e, The inner, and,
f, The outer condyle of the os humeri. Between *e* and *f*, the hollow for lodging the coronoid process of the ulna in the flexion of the fore-arm.
D, The radius.
g, The head of the radius.
E, The ulna.
h, The coronoid process of the ulna.
F, The bones of the carpus.
G, The metacarpal bone of the thumb.
H, The metacarpal bones of the fingers.
I, The two bones of the thumb.
K, The three phalanges of the fingers.

UNDER EXTREMITY.

A, The os femoris.
d, The ball or head of this bone, lodged in the acetabulum.

TABLE I. CONTINUED.

e, The cervix of the bone.

f, The large trochanter.

g, The small trochanter.

h, The inner condyle.

i, The outer condyle.

B, The patella, placed upon the trochlea of the os femoris.

C, The tibia.

k, The head of the tibia, between which and the condyles of the os femoris, the semilunar cartilages appear.

l, The tubercle of the tibia.

m, The malleolus internus.

D, The fibula, the upper end of which is connected with the tibia.

n, The malleolus externus.

E, The bones of the tarsus.

o, The projection of the os calcis.

F, The metatarsal bones.

G, The phalanges of the toes.

TABLE II.

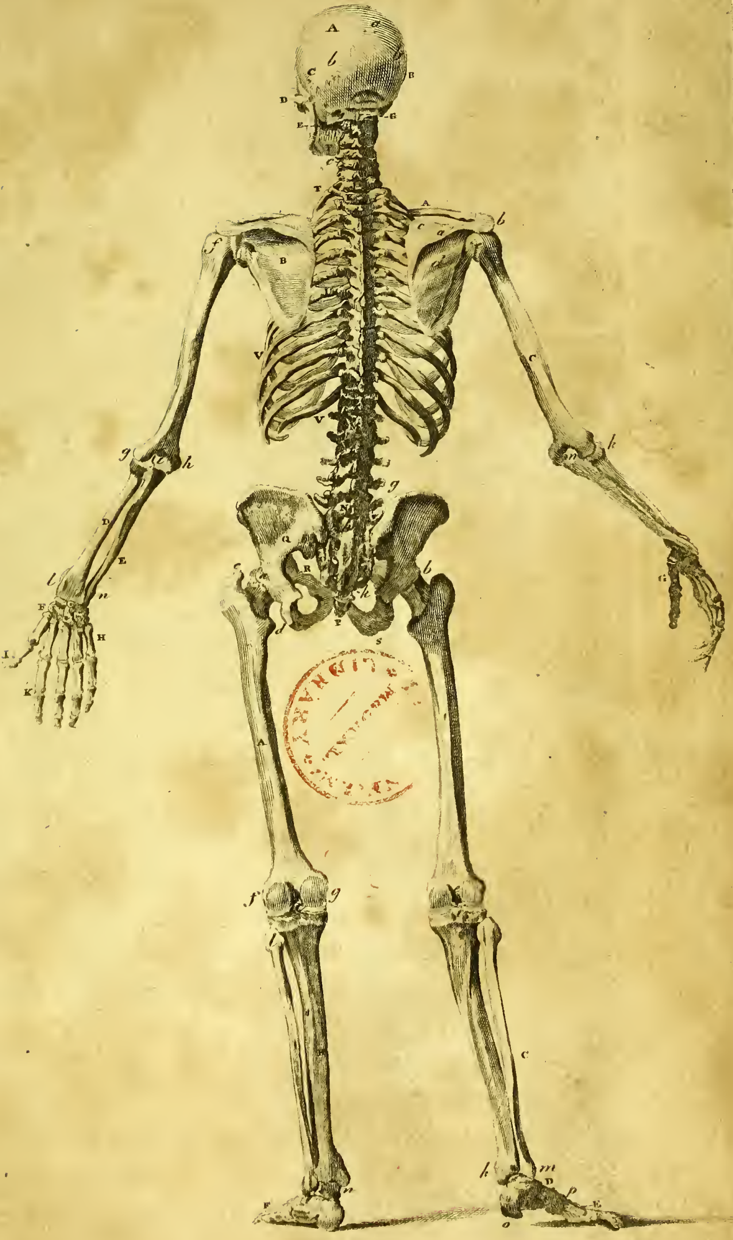
REPRESENTS a Back View of the MALE SKELETON, with some of the CARTILAGES and LIGAMENTS which connect the BONES to each other.

HEAD *and* TRUNK.

A, The parietal bone.
a, The sagittal suture, and parietal holes.
B, The occipital bone.
b, *b*, The lambdoid suture.
C, The joining of the temporal and parietal bones.
D, The cheek-bone.
E, F, The inner or back part of the jaws, with the teeth.
G, The first cervical vertebra.
H, The second cervical vertebra.
I, The seventh cervical vertebra.
c, The spinous processes of the cervical vertebræ.
K, The first dorsal vertebra.
L, The twelfth dorsal vertebra.
d, The spinous processes of the dorsal vertebræ.
e, Their transverse processes.
M, The first lumbar vertebra.
N, The fifth lumbar vertebra.
f, Their spinous, and,
g, Their transverse processes.
O, The os sacrum.
h, The uppermost spinous process. Farther out are seen the superior oblique processes of this bone, joined to the inferior oblique of the last lumbar vertebra.

i, *i*, The

TAB. II.


A
a
b
b
B
C
c
D
E
G
c
T
A
b
c
a
d
f
B
V
C
V
g
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o

i, *i*, The lateral parts of the os sacrum, joined to the ossa innominata. Between *i* and O, the posterior foramina of the os sacrum.

k, An opening in the under and back part of this bone, covered in the subject by a ligamentous membrane.

P, The os coccygis, joined by its shoulders to the os sacrum at the lower part of the opening *k*.

Q, The os ilium.

R, The os pubis.

S, The os ischium.

T, U, The seven true ribs.

V, V, The five false ribs.

SUPERIOR EXTREMITY.

A, The clavicle.

B, The dorsum scapulæ.

a, The spine of the scapula.

b, The acromion of the scapula.

c, A fossa for lodging the supra-spinatus muscle.

d, An irregular surface, occupied by the infra-spinatus muscle.

C, The os humeri.

e, The ball of the os humeri.

f, The external tubercle of the bone.

g, The external condyle.

h, The internal condyle.

i, Cavity for lodging the olecranon of the ulna.

D, The radius.

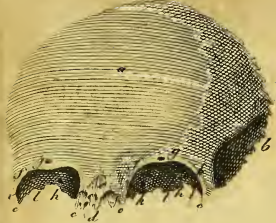
k, The head of the radius, articulated with the trochlea of the os humeri.

l, The under end of the radius, grooved by the tendons of muscles.

E, The

TAB. III.

Fig. 1.



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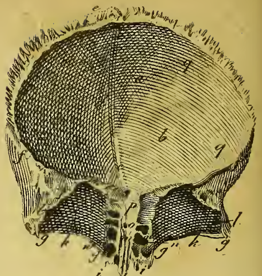

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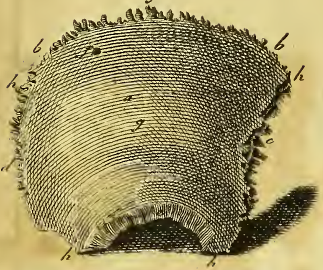

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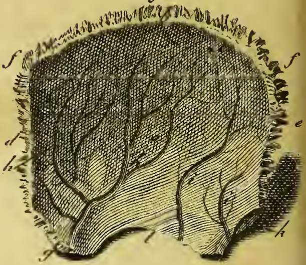

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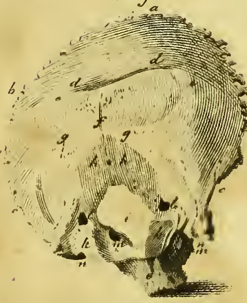

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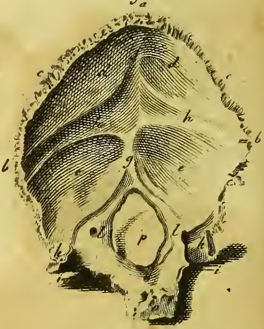

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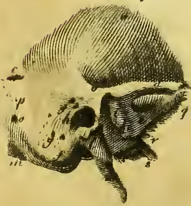

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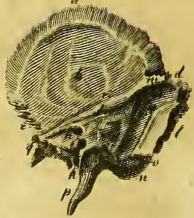

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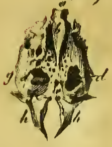
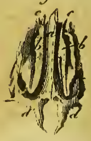


Fig. 10.



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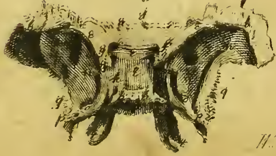

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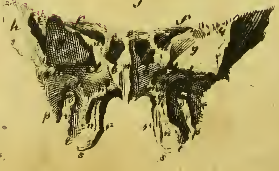

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TABLE III.

VIEWS of the different BONES of the CRANIUM.

FIG. 1.

The Outer Surface of the FRONTAL BONE.

a, The middle and convex part of the bone.
b, Part of the temporal fossa.
c, *c*, *c*, *c*, The angular processes.
d, The nasal process.
e, Eminences and cavities to which the nasal and maxillary bones are fixed.
f, *f*, The superciliary arches.
g, *g*, The superciliary holes.
h, *h*, The orbitar plates.
i, *i*, The lacrymal fossæ.
k, *k*, The internal orbitar foramina.
l, *l*, Inequalities which unite this bone to the os sphenoides.

FIG. 2.

The Inner Surface of the FRONTAL BONE.

a, The concave part of the bone.
b, The cavity which lodges the anterior lobes of the brain.
c, The frontal spine.
d, The furrow where the falx is fixed, and the superior longitudinal sinus is lodged.
e, The ragged edge of the bone, which assists in forming the coronal suture.
f, *f*, Other inequalities, which join the frontal to the sphenoid bone.
g, *g*, *g*, *g*, The inner surface of the angular processes.
h, The posterior surface of the nasal process.
i, *i*, Other inequalities, near the nasal process.
k, *k*, The orbitar plates.

l, *l*, The

l, *l*, The lacrymal fossæ.

m, *m*, Cells which correspond with those of the ethmoid bone.

n, *n*, The passages from the frontal sinuses.

o, The foramen cæcum.

p, The opening which receives the cribriform plate of the œthmoid bone.

q, *q*, Furrows which lodge the blood-vessels of the dura mater.

FIG. 3.

External Surface of the Right PARIETAL BONE.

a, The middle convex part of the bone.

b, *b*, The upper ragged edge of the bone, which, when joined to its fellow, forms the sagittal suture.

c, The anterior edge, which assists in forming the coronal suture.

d, The posterior edge, which joins the occipital bone, and forms the lambdoid suture.

e, The inferior semilunar edge, which joins the squamous part of the temporal bone.

f, The parietal hole.

g, An arched ridge, which gives origin to a large share of the temporal muscle.

h, *h*, *h*, *h*, The angles of the bone.

FIG. 4.

Internal Surface of the same PARIETAL BONE.

a, The middle concave part.

b, The inner surface of the upper edge of the bone, where the indentations are more apparent than those of the outer side.

c, The parietal hole.

d, The anterior serrated edge of the bone.

e, The posterior edge, more indented than the anterior one.

f, *f*, The superior angles.

g, The inferior-anterior angle, where the beginning of the furrow is seen, which lodges the trunk of the principal artery of the dura mater.

h, *h*, The ramifications of that furrow.

i, *i*, Small furrows which lodge other arteries of the dura mater.

k, A depression which lodges part of the lateral sinus.

l, The inferior edge of the bone, considerably thinner than the rest.

FIG. 5.

View of the External Surface of the OCCIPITAL BONE.

a, The superior angle of the bone.

b, *b*, The ragged edge, which assists in forming the lambdoid suture.

c, *c*, The irregularities at the lateral and inferior parts of the bone, where it is joined to the ossa temporum.

d, *d*, The large transverse arched ridge, or spine.

e, *e*, Muscular prints upon the transverse ridge.

f, The perpendicular spine.

g, The smaller arched ridge, crossing the perpendicular spine.

h, *h*, Muscular prints above,

i, The foramen magnum.

k, *k*, The occipital condyles.

l, *l*, The posterior condyloid foramina.

m, *m*, The inner side of the left, and outer side of the right anterior condyloid foramen.

n, *n*, Nitches which assist in forming the holes common to the occipital and temporal bones.

o, The cuneiform process, marked by the attachment of muscles.

FIG. 6.

Internal Surface of the OCCIPITAL BONE.

a, The superior angle of the bone.

b, b, The middle or lateral angles.

c, c, Eminences and cavities which assist in forming the lambdoid suture.

d, d, The superior occipital fossæ, which lodge a share of the posterior lobes of the brain.

e, e, The inferior occipital fossæ, which contain part of the cerebellum.

f, The upper limb of the perpendicular spine, which receives the superior longitudinal sinus, and has the falx fixed to it.

g, The lower limb of that spine, to which the falx minor is fixed.

h, h, The fossæ, which contain the lateral sinuses, and have the tentorium fixed to their edges.

i, i, The openings which form part of the foramina lacera, common to this bone and to the os temporis.

k, k, The small processes which assist in forming the foramina lacera.

l, l, The posterior condyloid holes.

m, The anterior condyloid hole of the right side.

n, The concave surface of the cuneiform process.

o, The inequalities of the cuneiform process, by which it is united with the sphenoid bone.

p, The foramen magnum.

FIG. 7.

The Outer Surface of the TEMPORAL BONE *of the Right Side.*

a, The upper and squamous part of the bone.

b, The under part, which lodges a portion of the temporal muscle.

c, That part of the bone which assists in forming the additamentum of the squamous suture.

d, The zygomatic process.

e, The transverse, or articular process.

f, The mastoid process.

g, Small holes, for transmitting vessels to the bone, or to the dura mater.

h, The meatus auditorius externus, surrounded by a rough margin.

i, The glenoid, or articular cavity.

k, The glenoid fissure, for the attachment of part of the articular ligament.

l, The vaginal process.

m, Part of the mastoid groove.

n, The styloid process.

o, The foramen mastoideum.

p, The base, or upper part of the mastoid process.

q, The inferior and anterior part of the bone, which joins the os sphenoides.

r, A small portion of the EUSTACHIAN tube.

s, The point of the pars petrosa.

FIG. 8.

The Inner Surface of the TEMPORAL BONE.

a, The upper edge of the squamous process.

b, The middle of that process, marked by the convolutions of the brain.

c, A part of the bone which joins the os sphenoides.

d, A nitch which receives the under and back part of the parietal bone.

e, The upper part of the pars petrosa.

f, A groove which lodges the superior petrosal sinus.

g, The fossa which lodges part of the lateral sinus.

h, The meatus auditorius internus.

i, The nitch which assists in forming the foramen lacerum.

k, Part of the fossa which lodges the beginning of the internal jugular vein.

l, The posterior part of the bone which joins the os occipitis.

m, The foramen mastoideum.

n, A portion of the mastoid process.

o, The mastoid groove.

p, The styloid process.

q, The inner extremity of the pars petrosa divided into two portions.

FIG. 9.

The Upper and Inner Surface of the ETHMOID BONE.

a, The anterior extremity of the bone, terminating in a small flat process.

b, The crista Galli.

c, *c*, The cribriform plate, for the passage of the olfactory nerves.

d, *d*, The posterior ethmoid cells.

e, The back part of the nasal plate, which forms part of the septum narium.

f, *f*, The posterior margin of the bone.

g, The os planum of the left side.

h, *h*, The sphenoid cornua, or triangular bones, which join the body of the sphenoid bone; their fore parts being fixed to the ethmoid one.

FIG. 10.

The Upper and Outer Surface of the ETHMOID BONE.

a, The nasal plate, which forms the upper part of the septum narium.

b, *b*, The ossa spongiosa superiora, convex towards the septum of the nose, and concave outwards.

Between the ossa spongiosa and nasal plate deep chinks are seen, which separate these processes from each other.

c, *c*, Inequalities by which this bone is joined to the frontal one.

d, *d*, The sphenoid cornua.

FIG. 11.

The Inner and Upper Surface of the SPHENOID BONE.

a, The fore part of the bone, which joins the under and back part of the frontal one.

b, *b*, The temporal plates or processes.

c, *c*, The transverse processes.

d, A small anterior process, which unites with the ethmoid bone.

e, The processus olivaris.

f, *f*, The foramina optica.

g, *g*, The anterior clinoid processes.

h, *h*, The posterior clinoid process.

i, *i*, Part of the foramina lacera.

k, *k*, Impressions made by the internal carotid arteries.

l, The sella Turcica....

m, *m*, The temporal fossæ, which receive the lateral lobes of the brain.

n, *n*, The foramina rotunda.

o, *o*, The foramina ovalia.

p, *p*, The foramina spinalia.

q, *q*, The ragged end of the bone, which assists in forming the sphenoid suture.

r, The back part of the body of the bone, which joins the cuneiform process of the occipital one.

s, s, Part of the spinous, and,
t, t, Part of the pterygoid process.

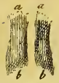
FIG. 12.

The Outer or Under Surface of the SPHENOID BONE.

a, The processus azygos.
b, b, The sphenoid cornua.
c, c, The opening of the sphenoid sinuses.
d, d, The foramina lacera.
e, The fore part of the body of the bone.
f, f, The outer surface of the transverse processes.
g, g, The orbitar plates.
h, h, The temporal processes.
i, i, The asperities by which this bone is joined to the ossa malarum.
k, k, Gutters, which lodge branches of the fifth pair of nerves.
l, l, The foramina rotunda.
m, m, The foramina pterygoidea.
n, n, Anterior openings, which assist in forming the sphenoid fissures.
o, o, The foramina ovalia.
p, p, The spinous processes.
q, q, The roots of the pterygoid processes.
r, r, The internal plates of the pterygoid processes.
s, s, Hook-like processes at the extremities of the internal plates.
t, t, The external plates of the pterygoid processes.
u, u, Parts of the bone adapted to the ossa palati.
v, v, Posterior openings, common to the occipital and temporal bones, over which the internal carotid arteries pass.

TAB. IV.

Fig. 1.



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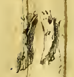

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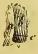

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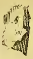

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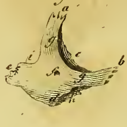

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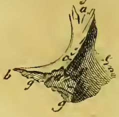

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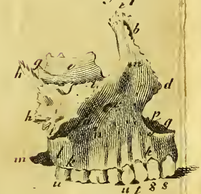

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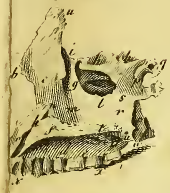

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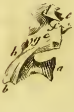

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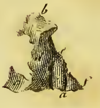

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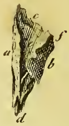

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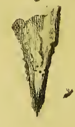

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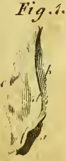

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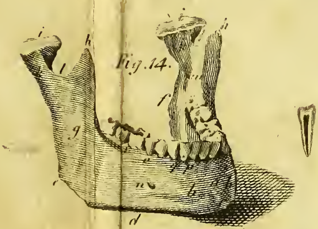

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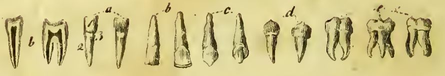

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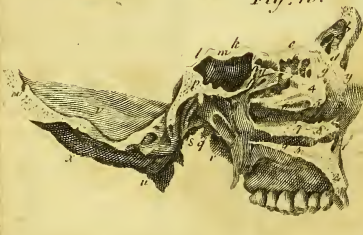

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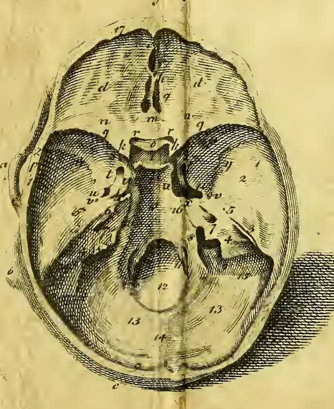
Fig. 17.



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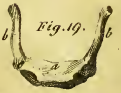

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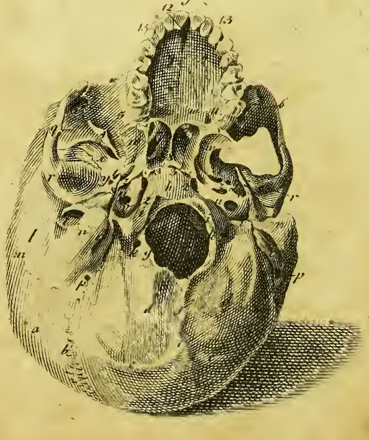

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g, A groove which belongs to the infra-orbitar canal.
h, *h*, *i*, *i*, The malar process.
k, *k*, The alveolar process.
l, The maxillary tuberosity.
m, A small portion of the os palati.
n, *n*, Small holes which penetrate the bone.
o, The fore part of the nostril.
p, The nasal spine, forming part of the partition of the nose.
q, The palate-plate.
r, The foramen infra-orbitarium.
s, *s*, The two dentes incisores.
t, The dens caninus.
u, *u*, The five dentes molares.

FIG. 8.

The Inner Surface of the SUPERIOR MAXILLARY, *and of the* PALATE BONES.

a, The nasal process, or upper angle.
b, The middle angle at the base of the nasal process.
c, Inequalities, where the fore part of the os spongiosum inferius is fixed.
d, The palate process.
e, The alveolar process.
f, The irregular surface of the palate process, which joins its fellow of the opposite side.
g, The maxillary sinus.
h, Small cells in the upper part of the bone.
i, The lacrymal fossa.
k, The palate fissure, which assists in forming the foramen incisivum.

l, The suture which unites this bone to the os palati.

m, The part of the bone which forms the largest share of the nasal fossa.

n, The nasal spine.

o, A rough surface, where the fore part of the bone joins its fellow.

p, The palate bone.

q, The small sinus commonly found in this bone.

r, The nasal lamella of the palate bone, forming part of the maxillary sinus, and of the cavity of the nostril.

s, An eminence, where this bone is connected to the inferior spongy one.

t, The rough surface, where the two palate bones unite.

u, The hole proper to this bone.

v, The foramen gustativum, vel palatinum posterius.

w, The pterygoid process.

x, *x*, The teeth.

FIG. 9.

The Posterior, and almost the whole of the Exterior Surface of the Left Os Palati.

a, The palate plate.

b, The pterygoid process.

c, The nasal plate.

d, The orbitar process.

e, A small sinus, corresponding with those of the ethmoid bone.

f, The notch which forms part of the foramen spheno-palatinum.

g, A small hole which penetrates the bone.

h, Part of the groove which helps to form the foramen gustativum.

FIG. 10.

The Anterior, and almost all the External Surface of the same PALATE BONE.

a, A notch which assists in forming the foramen gustativum.
b, The orbitar process.
c, The palate plate.
d, The nasal plate.
e, The groove which helps to form the foramen gustativum.
f, The pterygoid process.

FIG. 11.

The External Concave Surface of the OS SPONGIOSUM INFERIUS *of the Left Side.*

a, The under edge of the bone turning outwards.
b, The upper edge, sending down a hook-like plate, to cover a portion of the maxillary sinus.
c, The broad anterior extremity, where the connection is chiefly made with the superior maxillary bone.
d, The posterior extremity, narrow and irregular in its surface.
e, The external surface, with numerous small holes, which mark its porosity.
f, The part which joins the os unguis, to form a share of the lacrymal groove.

FIG. 12.

The Inner Convex Surface of the same Os Spongiosum Inferius, *which, like the External Surface, is also of a Spongy Texture.*

FIG. 13.

The Left Side of the Vomer.

a, The hollow surface, which receives the processus azygos of the sphenoid bone.
b, The anterior and upper edge, which is connected to the nasal plate of the ethmoid bone, and middle cartilage of the nose.
c, The inferior edge, which is connected to the palate plates of the superior maxillary and palate bones.
d, A ridge upon the side of the vomer.

FIG. 14.

The Lower Jaw, *viewed from the Right Side.*

a, The symphysis of the jaw.
b, *b*, Muscular prints.
c, Another depression, which marks the middle of the chin.
d, The base of the jaw.
e, The angle of the right side.
f, The inner surface of the angle of the left side.
g, The ascending plate, with muscular prints.
h, *h*, The coronoid, and,
i, *i*, The condyloid processes.
k, *k*, The cervix on each side.
l, *l*, Semilunar notches between the processes.

TABLE IV. CONTINUED.

m, The posterior maxillary foramen.
n, The anterior maxillary foramen.
o, The alveoli of the teeth.
p, The two dentes incisores of the right side.
q, The dens caninus.
r, The five dentes molares.

FIG. 15.

The TEETH.

a, A fore and back view of the incisores of the under jaw.
  1. The base or body of a tooth, covered with enamel.
  2. The root, or fang, destitute of enamel.
  3. The neck, or collar.

b, Sections of two teeth, to shew the extent of the enamel, with the direction of its fibres—The fibrous and lamellated structure of the osseous part—The internal cavity for containing the pulp.

The second *b* shews a fore and back view of the incisores of the upper jaw.

c, A fore and back view of the dentes canini.
d, The two small molares.
e, The three large molares.

FIG. 16.

The Left Portion of the Base of the SKULL, *divided from the Septum Narium, by a perpendicular Section, proceeding in a straight line from before backwards.*

a, Part of the frontal bone.
b, The posterior lamina, called vitrea.
c, The frontal sinus.
d, Part of the transverse suture, dividing the frontal from the superior maxillary bone.

TABLE IV. CONTINUED.

e, Part of the frontal bone, contiguous to the os ethmoides.
f, The upper part of the ethmoid bone.
g, *g*, The cells of the ethmoid bone, the anterior of which are entire, the rest laid open.
h, *h*, The openings of the ethmoid cells into the nose.
i, The uppermost passage of the nostril.
k, The left anterior clinoid process of the sphenoid bone.
l, The posterior clinoid process.
m, The sella Turcica.
n, The left sphenoid sinus.
o, The part where the sinus opens into the upper and back part of the nose.
p, A section of the body of the sphenoid, and of the cuneiform process of the occipital bone.
q, The spinous process of the sphenoid bone.
r, The internal pterygoid plate.
s, The fore part of the meatus auditorius.
t, The superior condyloid foramen.
u, The mastoid process of the temporal bone.
v, The inner side of the occipital bone.
w, The cut edge of that bone.
x, The under and outer part of that bone.
y, The nasal process of the superior maxillary bone.
z, The inner side of that bone forming the middle passage of the nostril.
1, Part of the same bone, which forms the beginning of the lower passage of the nostril.
2, A section of the alveolar process.
3, A section of the osseous palate.
4, The os spongiosum superius.
5, The middle passage of the nostril.

6, The opening of the antrum maxillare.
7, The os spongiosum inferius.
8, That part of the inferior spongy bone which lies over the opening of the lacrymal duct.
9, The lowest passage of the nostril.

FIG. 17.

A View of the Inner Surface of the Base of the CRANIUM.

a, The zygoma.
b, The mastoid process of the temporal bone.
c, The external surface of the occipital bone.
d, *d*, The frontal fossæ marked by the brain.
e, part of the frontal spine.
f, The foramen cæcum, placed at the bottom of the frontal spine.
g, The cribriform plate of the ethmoid bone.
h, The crista galli of this bone.
i, The sella Turcica of the sphenoid bone.
k, *k*, The anterior clinoid processes.
l, The posterior clinoid process.
m, A small process of the sphenoid bone, fixed to the ethmoid one.
n, *n*, Part of the sphenoid suture.
o, The processus semi-olivaris.
p, *p*, The temporal fossæ.
q, *q*, The transverse spinous processes.
r, *r*, The foramina optica.
s, *s*, A small portion of the foramina lacera.
t, *t*, The foramina rotunda.
u, *u*, The foramina ovalia.
v, *v*, The foramina spinalia.

w, *w*, Impressions made by the internal carotid arteries.

x, *x*, Points of the partes petrosæ of the temporal bones, and, before these, irregular openings, which in the subject are filled, partly by bone, and partly by a ligamentous substance.

y, *y*, Suture common to the sphenoid and temporal bones.

1, 1, Squamous parts of the temporal bones, which complete,

2, 2, The temporal fossæ for the lateral lobes of the brain.

3, 3, The ridge of the pars petrosa on each side, to which the tentorium is fixed.

4, 4, The posterior surface of the pars petrosa on each side, which is opposed to the cerebellum.

5, The foramen innominatum.

6, The groove which lodges the superior petrosal sinus.

7, 7, The meatus auditorii interni.

8, 8, The foramina lacera common to the temporal and occipital bones.

9, 9, The fossæ for lodging the lateral sinuses.

10, The cuneiform process of the occipital bone.

11, 11, The anterior condyloid foramina of that bone.

12, The foramen magnum.

13, 13, The inferior occipital fossæ, which lodge the corresponding lobes of the cerebellum.

14, The inferior limb of the cruciform spine, to which the falx minor is fixed.

15, Part of the lambdoid suture.

16, 16, The fossæ for the inferior petrosal sinuses.

17, 17, The cut edge of the skull.

See TAB. IV*a*.

FIG. 18.

Represents the Outer and Under Surface of the SKULL, *turned a little to the Left Side.*

a, The parietal bone.
b, The lambdoid suture.
c, *c*, The large transverse arched ridge of the occipital bone.
d, *d*, The smaller transverse ridge, with muscular prints on each side of it.
e, The spinous tuberosity, seen in some skulls only.
f, The perpendicular spine.
g, The foramen magnum.
h, The cuneiform process.
i, *i*, The articular or condyloid processes.
k, *k*, The posterior condyloid foramina.
l, The squamous portion of the temporal bone.
m, The squamous suture.
n, *n*, The mastoid processes.
o, *o*, The mastoid fissures.
p, The foramen mastoideum.
q, The zygoma and zygomatic suture.
r, The glenoid cavity at the root of the zygoma, for the articulation of the lower jaw.
s, *s*, The styloid processes, behind the roots of which the foramina stylo-mastoidea are concealed.
t, The meatus auditorius externus.
u, *u*, The foramina carotica.
v, *v*, The jugular fossæ.
w, *w*, The pterygoid fossæ, at the sides of which are the pterygoid plates.
x, The temporal process of the sphenoid bone.

y, The spinous process and spinous hole of that bone.
z, *z*, The osseous mouths of the EUSTACHIAN tubes.
1, 1, The foramina ovalia.
2, 2, Passages common to the occipital, temporal, and sphenoid bones.
3, 3, The foramina pterygoidea.
4, The inferior orbitar fissure.
5, The under part of the tuber or bulge of the superior maxillary bone.
6, 6, The inner sides of the ossa malarum.
7, 7, The superior and inferior spongy bones, with a view of the back part of the nostrils.
8, The posterior edge of the vomer.
9, 9, The palate plates of the superior maxillary bones, with the longitudinal palate suture.
10, 10, The palate plates of the palate bones, with the transverse, and continuation of the longitudinal palate sutures.
11, 11, The foramina gustativa, or posterior palate holes.
12, The foramen incisivum, or anterior palate hole.
13, 13, The teeth, divided into, two incisores, one caninus, two small molares, and three large molares on each side.

FIG. 19.

The OS HYOIDES, *seen from the Upper and Fore Part.*

a, The body of the os hyoides.
b, *b*, Its cornua.
c, *c*, Its appendices.

TABLE IV*a*.

The different parts of this Figure are the same with those of TAB. IV. FIG. 17. but of the natural size.

TAB. V.

Fig. 1.

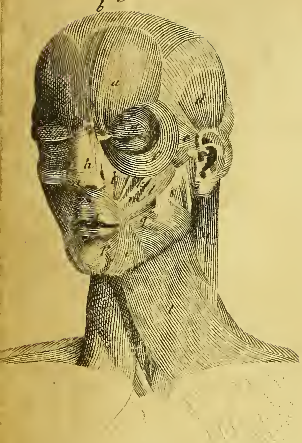

Fig. 2.

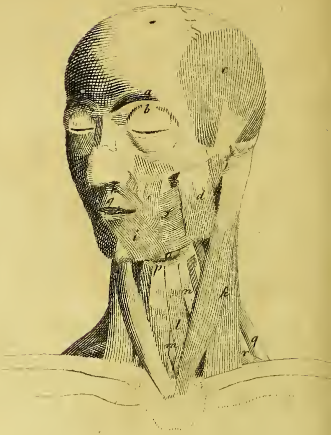

Fig. 3.

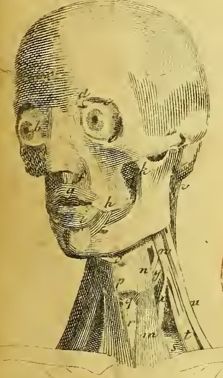

Fig. 4.

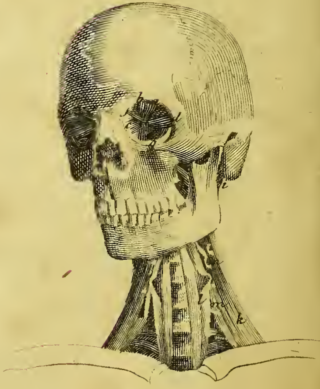

TABLE IV.

Represents the different Bones of the Face, a Section of the Nose, and Inner and Under Sides of the Skull, with the Small Bone termed Os Hyoides.

FIG. 1.

The Outer Surface of the Ossa Nasi.

a, *a*, The upper part, which is joined to the frontal bone.
b, *b*, The lower ragged end, to which the cartilage of the nose is fixed.
The black points represent holes penetrating the bones.

FIG. 2.

The Inner Surface of the Ossa Nasi.

a, *a*, The inner edge of each, thick and strong, where it joins its fellow, and sends a spine backwards, to be fixed to the partition of the nose.
b, *b*, The cavity which forms part of the arch of the nose.

FIG. 3.

The outer Surface of the Left Os Unguis.

a, The lacrymal process, prrforated by numerous holes.
b, The orbitar process.
c, The ridge which separates the processes.

FIG. 4.

The Inner Side of the Os Unguis, *with Eminences and Cavities which belong to the Ethmoid Cells.*

FIG.

FIG. 5.

The Outer Surface of the Right Os Malæ.

a, The superior orbitar process.
b, The inferior orbitar process.
c, The internal orbitar plate.
d, The maxillary process.
e, The zygomatic process.
f, The external orbitar hole.
g, *g*, The under and outer edge of the orbit.
h, Part of the inner rough surface of the maxillary process.
i, The zygomatic nitch.

FIG. 6.

The Inner Surface of the same Os Malæ.

a, *b*, *c*, *d*, *e*, as in Fig. 5.
f, The internal fossa, and situation of the external orbitar hole.
g, *g*, The rough edge which joins the os malæ to the superior maxillary bone at the external orbitar suture.

FIG. 7.

The Outer Side of the Right Superior Maxillary Bone, *with a small Portion of the* Os Palati.

a, The maxillary fossa.
b, The nasal process of the maxillary bone.
c, Inequalities, by which it is joined to the os frontis.
d, The angle which is joined to the under end of the os nasi, and to the cartilage of the nose.
e, The orbitar plate.
f, The edge of the orbit.

TAB. 5.

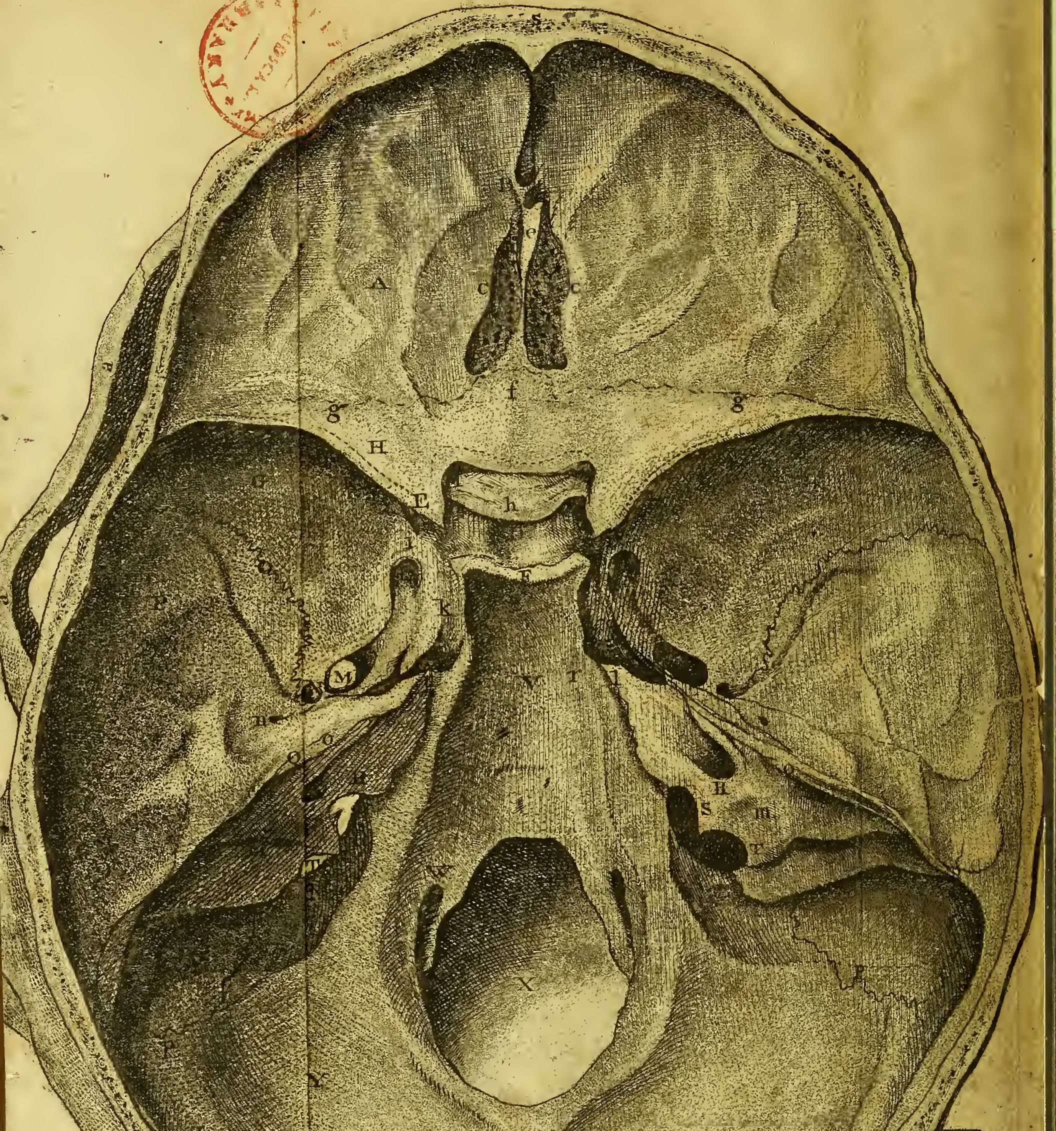

TABLE V.

REPRESENTS the MUSCLES situated on the Fore Part of the HEAD and NECK.

FIG. 1.

The First Order of MUSCLES *on the Fore Part of the* HEAD *and* NECK, *after the Integuments have been removed.*

a, The frontal part of the occipito-frontalis.
b, The tendon of that muscle.
c, A fleshy slip descending from the occipito-frontalis over the root of the nose.
d, The attollens aurem.
e, The anterior auris.
f, The orbicularis palpebrarum.
g, The ciliary part of the orbicularis.
h, The compressor naris.
i, The levator labii superioris alæque nasi.
k, The zygomaticus minor.
l, The zygomaticus major.
m, The levator anguli oris.
n, The cartilage of the nose.
o, The depressor anguli oris.
p, The depressor labii inferioris.
q, The buccinator.
r, The orbicularis oris.
s, The masseter.
t, The platysma myoides, its upper end passing over the jaw.
u, The sterno-cleido-mastoideus.

FIG.

FIG. 2.

The Second Order of MUSCLES *on the Fore Part of the* HEAD *and* NECK.

a, The corrugator supercilii.
b, The levator palpebræ superioris.
c, The temporalis, the tendon of which is seen passing under the zygoma.
d, The masseter.
e, The levator anguli oris.
f, The buccinator.
g, The orbicularis oris.
h, The nasalis labii superioris, at the upper side of which is a portion of the depressor labii superioris alæque nasi.
i, The depressor labii inferioris.
k, The sterno-cleido-mastoideus.
l, The sterno-hyoideus.
m, Part of the trachea.
n, The omo-hyoideus.
o, The hyo-thyroideus.
p, The os hyoides.
q, The levator scapulæ.
r, The scalenus medius.

FIG. 3.

The Third Order of MUSCLES *on the Fore Part of the* HEAD *and* NECK.

a, The insertion of the abductor oculi.
b, The adductor oculi of the right side.

c, The insertion of the levator oculi.

d, The trochlea, and part of the tendon of the obliquus superior.

e, The obliquus inferior.

f, The depressor labii superioris alæque nasi.

g, The orbicularis oris.

h, The buccinator.

i, The levator labii inferioris.

k, Part of the pterygoideus externus.

l, Part of the pterygoideus internus.

m, The sterno thyroideus.

n, The thyro hyoideus.

o, The os hyoides.

p, The thyroid cartilage.

q, The cricoid cartilage, with the two crico-thyroid muscles arising from it.

r, The trachea.

s, Part of the pleura.

t, The scalenus anticus.

u, The scalenus medius.

v, A portion of the trachelo-mastoideus.

w, The rectus capitis anterior major.

x, The longus colli.

y, The constrictor pharyngis inferior.

FIG. 4.

The Fourth Order of MUSCLES *on the Fore Part of the* HEAD *and* NECK.

a, The levator palpebræ superioris.

b, The levator oculi.

c, The adductor oculi.
d, The abductor oculi.
e, The depressor oculi.
f, The obliquus superior.
g, The obliquus inferior.
h, The pterygoideus internus.
i, The obliquus superior capitis.
k, The scalenus medius.
l, The longus colli.
m, *m*, The intertransversales colli.

Fig. 1.

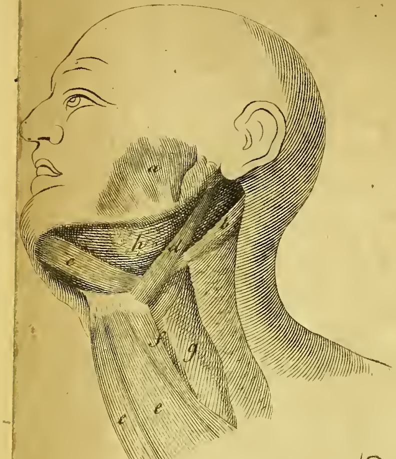

Fig. 2.

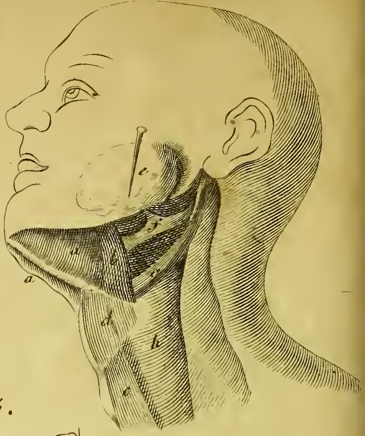

Fig. 4.

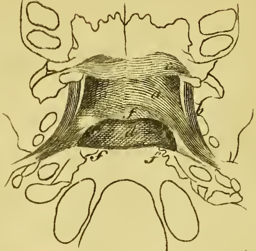

Fig. 3.

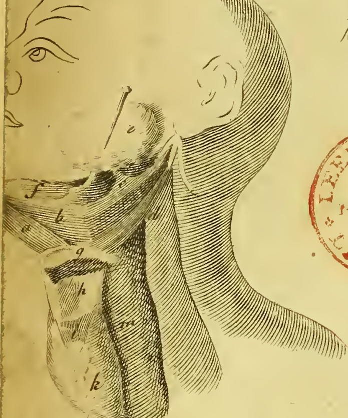

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Fig. 5.

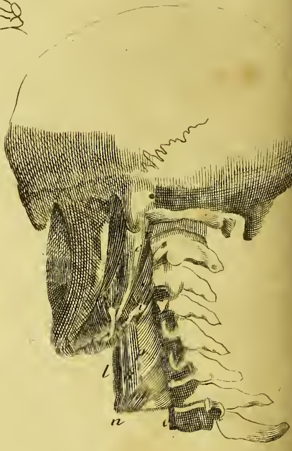


Fig. 6.

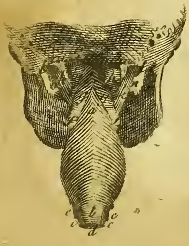


Fig. 7.

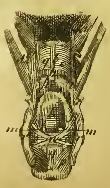


TABLE VI.

REPRESENTS the MUSCLES situated about the THROAT.

FIG. 1.

Part of the Muscles of the OS HYOIDES.

a, Part of the masseter.
b, The posterior head of the digastric.
c, Its anterior head.
d, The stylo-hyoideus, with the tendon of the digastric passing through it.
e, *e*, The sterno-hyoidei.
f, The omo-hyoideus.
g, The pharynx.
h, The submaxillary gland.

FIG. 2.

MUSCLES *deeper seated than the former.*

a, *a*, The mylo-hyoidei.
b, The hyo-glossus.
c, The sterno-thyroideus.
d, The thyro-hyoideus.
e, The submaxillary gland, raised from its place behind the angle of the lower jaw.
f, The stylo-glossus, supported by a ligament.
g, The stylo-pharyngeus.
h, The pharynx.

FIG.

FIG. 3.

MUSCLES *deeper seated than the former.*

a, The genio-hyoideus.
b, The genio-hyo-glossus.
c, The stylo-glossus, with its supporting ligament.
d, The stylo-pharyngeus.
e, The submaxillary gland, raised, by which its duct is seen advancing towards its termination at the side of the frænum linguæ.
f, The sublingual gland.
g, The os hyoides.
h, The thyroid cartilage.
i, The cricoid cartilage, with the crico-thyroid muscles.
k, The thyroid gland.
l, The trachea.
m, The pharynx.

FIG. 4.

Muscles of the PALATE, *viewed on the Under Side.*

a, The levator palati.
b, *c*, The circumflexus palati; *c*, Its tendon passing over the hook-like process of the pterygoid plate.
d, The membrane of the palate.
e, *e*, The mouths of the EUSTACHIAN tubes.
f, *f*, *f*, The circumference from which the membrane of the palate is cut of.

FIG. 5.

A Lateral View of the MUSCLES *seated under the* HEAD, *and before the Vertebræ of the* NECK.

a, The pterygoideus externus.

b, The pterygoideus internus.
c, The mylo-hyoideus.
d, The stylo-hyoideus.
e, *f*, The digastricus.
g, *h*, The hyo-glossus.
i, The os hyoides.
k, The thyro-hyoideus.
l, The thyroid cartilage.
m, The crico-thyroideus.
n, The cricoid cartilage.
o, A section of the esophagus.
p, The constrictor pharyngis inferior.
q, The constrictor pharyngis medius.
r, The constrictor pharyngis superior.

FIG. 6.

A Back View of the PHARYNX, *with the Under Part of the* BONES *of the* HEAD, *to which the Pharynx is fixed.*

a, The upper point of the constrictor pharyngis inferior.
b, The upper end of the pharynx, and inner transverse fibres of the esophagus.
c, *c*, The outer fibres of the esophagus, descending obliquely backwards on each side.
d, A section of the esophagus.
e, *e*, A section of the trachea.
f, *f*, The extremities of the cornua of the os hyoides, with the ligaments which join them to the superior cornua of the thyroid cartilage.
g, *g*, The constrictor pharyngis medius, on each side.
h, *h*, The constrictor pharyngis superior, on each side.
i, The naked membrane of the pharynx.

k, *k*, The stylo pharyngeus, on each side.
l, *l*, The styloid processes of the temporal bones.
m, *m*, The pterygoid process of the sphenoid bone.
n, *n*, The backmost tooth of the upper and under jaws, on each side.

FIG. 7.

The MUSCLES *lying immediately under the* MEMBRANE *of the* PHARYNX, *which, with the* ESOPHAGUS *and* TRACHEA, *are removed.*

a, The levator palati.
b, The azygos uvulæ.
c, The palato-pharyngeus.
d, That part of it which passes under the levator palati.
e, That part of it called by ALBINUS *Salpingo-pharyngeus.*
f, Part of the common end of the palato-pharyngeus and stylo pharyngeus.
g, The posterior edge of the velum palati.
h, The uvula.
i, The tonsil, projecting before the palato-pharyngeus muscle.
k, The tongue.
l, The epiglottis.
m, *m*, The points of the arytenoid cartilages.
n, The arytenoidei obliqui.
o, *o*, The arytenoideus transversus.
p, The crico arytenoideus posticus.
q, The cricoid cartilage.
r, *r*, The posterior edges of the thyroid cartilage, which conceal the two small muscles on each side, termed *Crico-arytenoideus Lateralis*, and *Thyro-arytenoideus.*

TAB. VII.

Fig. 1.

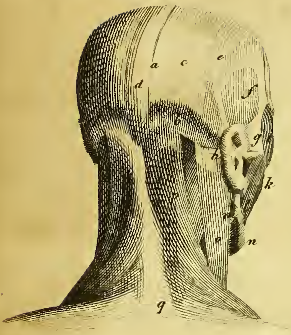


Fig. 2.

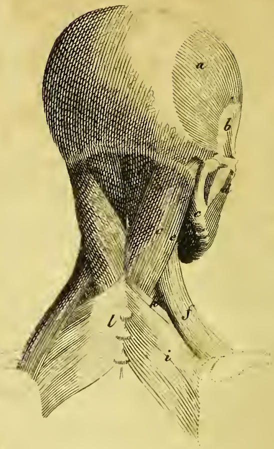
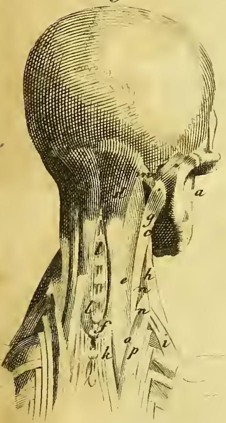


Fig. 3.



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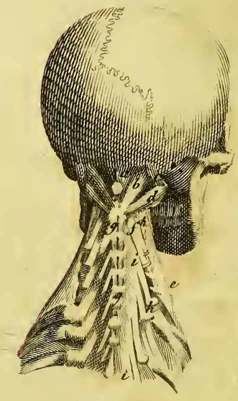

TABLE VII.

REPRESENTS the MUSCLES situated on the Back Part of the HEAD and NECK.

FIG. 1.

The First Order of MUSCLES *on the Back Part of the* HEAD *and* NECK, *after the Integuments have been removed.*

a, The occipital part of the occipito-frontalis muscle.
b, The fleshy, and,
c, The tendinous part of this muscle.
d, A tendinous membrane, joining the opposite sides of the muscle.
e, Part of the tendinous membrane, covering the upper part of the temporal muscle.
f, The attollens aurem.
g, The anterior auris.
h, A small portion of the retrahentes aurem.
i, The back part of the orbicularis palpebrarum.
k, The zygomaticus major.
l, The masseter.
m, The pterygoideus internus.
n, The platysma myoides.
o, The sterno-cleido-mastoideus.
p, The upper end of the trapezius.
q, The tendinous portions of that muscle, in the nape of the neck, called *Ligamentum Nuchæ*.

FIG. 2.

The Second Order of MUSCLES *on the Back Part of the* HEAD *and* NECK.

a, The temporalis, the aponeurosis being removed.
b, The tendon of the temporal muscle, passing under the zygoma.
c, The pterygoideus internus.
d, The masseter.
e, The mylo-hyoideus.
f, The levator scapulæ.
g, The splenius.
h, The upper end of the complexus.
i, A portion of the rhomboides major.
k, Part of the rhomboides minor.
l, The upper end of the serratus posticus superior.

FIG. 3.

The Third Order of MUSCLES *on the Back Part of the* HEAD *and* NECK.

a, The back part of the buccinator.
b, The pterygoideus internus.
c, The mylo-hyoideus.
d, *e*, *f*, The complexus; *f*, A fleshy slip from the spinous process of the first dorsal vertebra.
g, The trachelo-mastoideus.
h, The scalenus medius.
i, The scalenus posticus.
k, The semi-spinalis colli.
l, *l*, The interspinales colli.
m, The obliquus capitis superior.

n, The tranversalis colli.
o, The upper end of the longissimus dorsi, joining the trachelo-mastoideus, and,
p, The fleshy slip from the sacro-lumbalis, called *Cervicalis Descendens.*

FIG. 4.

The Fourth Order of MUSCLES *on the Back Part of the* HEAD *and* NECK.

a, The rectus capitis posterior minor.
b, The rectus capitis posterior major.
c, The obliquus capitis superior.
d, The obliquus capitis inferior.
e, The scalenus medius.
f, The upper end of the multifidus spinæ.
g, *g*, The interspinales colli.
h, *h*, The intertransversales colli.
i, *i*, The semi-spinalis colli.

TABLE VIII.

Represents Muscles on the Fore Part of the Trunk of the Body.—On the Right Side, the Muscles are exposed which lie immediately under the Common Integuments.—On the Left Side, the Muscles are seen which are placed under the former.

Thorax.

a, The under end of the platysma myoides.
b, The pectoralis major, with the deltoides at the outer side of it.
c, *c*, Part of the serratus magnus.
d, The edge of the latissimus dorsi.
e, The subclavius.
f, The pectoralis minor.
g, *g*, The serratus magnus. Farther out, the subscapularis is seen.
h, *h*, The intercostales interni, the tendinous fascia being removed.

Abdomen.

i, *i*, The obliquus descendens externus.
k, The beginning of the tendon of that muscle.
l, The obliquus internus, shining through the tendon of the obliquus externus.
m, *m*, The linea semilunaris.
n, *n*, The rectus abdominis, also shining through the tendon of the obliquus externus.

TAB. VIII.

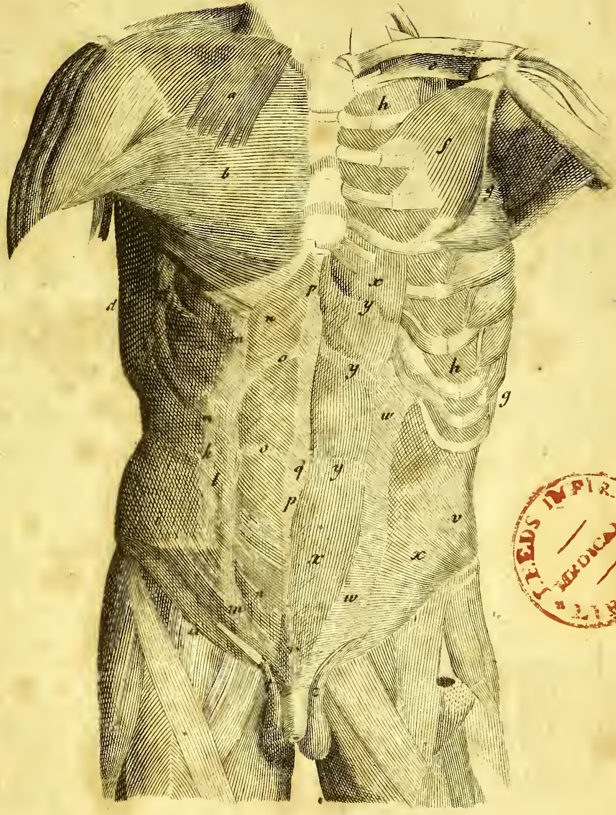

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TABLE VIII. CONTINUED.

o, *o*, The tendinous intersections of the rectus.

p, *p*, The linea alba.

q, The umbilicus.

r, The pyramidales.

s, The ring of the external oblique muscle, transmitting the spermatic cord.

t, The cremaster muscle, covering the spermatic cord.

u, The lower edge of the external oblique muscle, termed *Ligament of* POUPART.

v, The obliquus internus ascendens.

w, *w*, The tendon of the obliquus internus, part of which is left covering the outer side of the rectus muscle.—Between the two *w*'s, the tendon splits into two layers, which inclose the rectus. From the lower *w* to the pubis, the whole of the tendon goes before the rectus.

x, *x*, The rectus abdominis.

y, *y*, *y*, The tendinous intersections of the rectus.

z, The cremaster testis.

TABLE IX.

Represents the Third Layer of Muscles on the Right, and the Fourth Layer of Muscles on the Left Side of the Anterior Part of the Trunk of the Body.

FIG. 1.

Thorax.

a, The intercostales externi.

b, *b*, *b*, *b*, The intercostales interni.

c, *c*, The convex or thoracic side of the diaphragm.

d, Its middle tendon.

e, *f*, *g*, *h*, The fleshy origins of the diaphragm, separated from the inferior margin of the thorax.

Abdomen.

i, The transversalis abdominis.

k, That portion of the tendons of the internal oblique and transverse muscles, which lies behind the rectus.

l, The remains of the tendons of the oblique and transverse muscles, forming the linea alba.

m, The spermatic vessels, passing under the edge of the transverse muscle.

n, The peritoneum, marked by one of the umbilical arteries and the urachus.

o, The tendinous crura of the inferior muscle of the diaphragm.

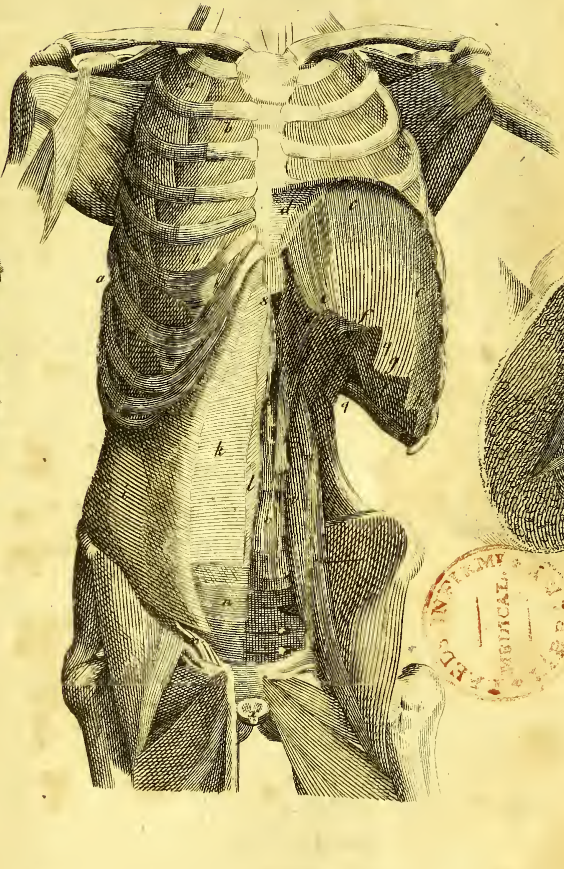
p, The passage for the aorta, between the crura.

q, *q*, The fleshy heads of the small muscle of the diaphragm.

r, The part where the fibres of the fleshy heads of the opposite sides cross each other to form,

s, The

Fig. 1.



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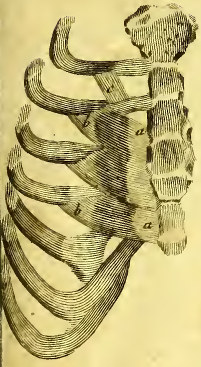

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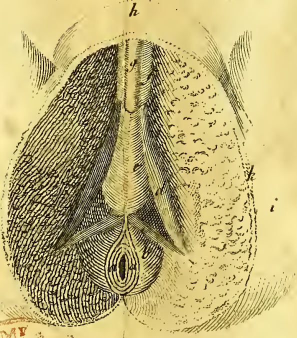

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s, A passage of the esophagus.
t, The origin of the diaphragm from the twelfth rib.
u, The psoas parvus.
v, *v*, The psoas magnus.
w, The iliacus internus.
x, A section of the penis, in which the corpora cavernosa appear.

FIG. 2.

A View of the Inner Surface of the STERNO-COSTALIS MUSCLE.

a, *a*, The tendinous origin, from the cartilago ensiformis, and under half of the middle bone of the sternum.
b, *b*, The tendinous insertion into the third, fourth, and fifth ribs.
c, Part of the sterno-costalis, passing between the second and third ribs, and which is found in some subjects only.

FIG. 3.

MUSCLES *about the Root of the* PENIS, *and Under End of the* INTESTINUM RECTUM,—*in a Child.*

a, *a*, The sphincter ani.
b, The levator ani.
c, The transversalis perinei.
d, The erector penis.
e, The accelerator urinæ.
f, The corpus cavernosum penis.
g, The corpus spongiosum urethræ.
h, The scrotum turned up.
i, Part of the thigh.
k, The cut edge of the integuments.

TABLE X.

REPRESENTS the First Layer of MUSCLES on the Right, and Second Layer of MUSCLES on the Left Side of the Back Part of the TRUNK of the BODY.

RIGHT SIDE.

a, *a*, The thoracic portion of the trapezius.
b, *b*, Its insertion into the spine of the scapula.
c, The ligamentum nuchæ.
d, *d*, The latissimus dorsi.
e, Its tendinous origin.
f, Part of the obliquus externus abdominis.
g, Part of the rhomboideus.

LEFT SIDE.

h, The rhomboides major, and,
i, The rhomboides minor, covering the serratus posticus superior.
k *, A portion of the serratus posticus superior, the rest of it extending as far under the rhomboides as the dotted line at *h*.
k, the serratus posticus inferior.
l, The part from which the latissimus dorsi was cut.
m, The under part of the serratus magnus.
n, The tendons of the sacro-lumbalis.
o, A portion of the longissimus dorsi.
p, Part of the semi-spinalis dorsi.
q, The spinalis dorsi.
r, The broad tendon common to the latissimus dorsi and serratus posticus inferior.

s, The

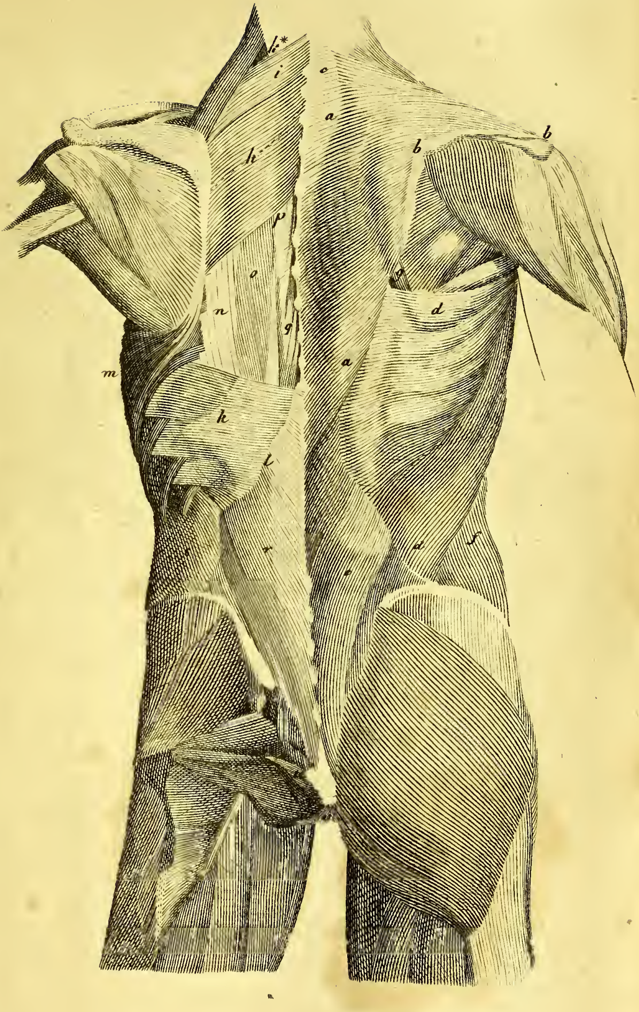

k*
i
c
a
b
h
b
p
o
g
d
n
q
a
m
k
l
r
d
f
e

TABLE X. CONTINUED.

s, The back part of the obliquus internus abdominis.

t, *t*, The intercostales externi.

u, The coccygeus.

v, The levator ani.

w, The sphincter ani.

TABLE XI.

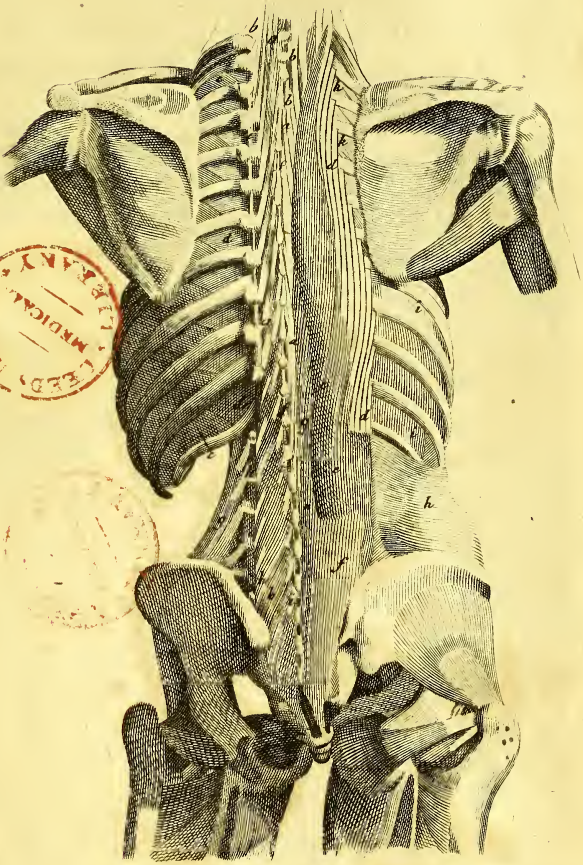
REPRESENTS the Third Layer of MUSCLES on the Right, and FOURTH Layer of MUSCLES on the Left Side, of the Back Part of the TRUNK of the BODY.

RIGHT SIDE.

a, *a*, *a*, The spinalis dorsi.
b, *b*, Part of the semi-spinalis dorsi.
c, The longissimus dorsi.
d, *d*, The tendons of the sacro-lumbalis.
e, The common fleshy head of the longissimus dorsi and sacro-lumbalis.
f, The tendon covering and partly giving origin to this fleshy head.
g, Part of this tendon upon the longissimus dorsi.
h, The transversalis abdominis.
i, *i*, The intercostales externi.
k, *k*, Portions of the intercostales externi, called by ALBINUS *Levatores Costarum*.

LEFT SIDE.

a, *a*, The semi-spinalis dorsi.
b, *b*, The multifidus spinæ.
c, *c*, The intercostales interni.
d, *d*, The pleura.
e, *e*, The intertransversales dorsi.
f, *f*, The interspinales dorsi.
g, The quadratus lumborum.
h, *h*, The intertransversales lumborum.
i, *i*, The interspinales lumborum.



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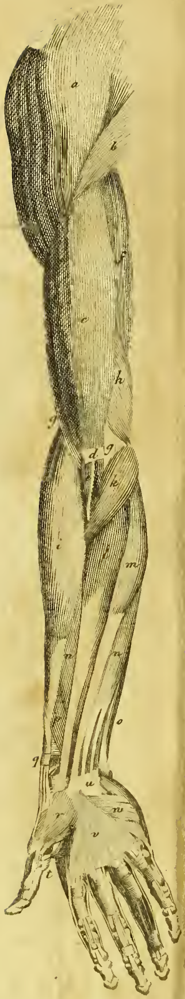
TAB. XII.

Fig. 1.



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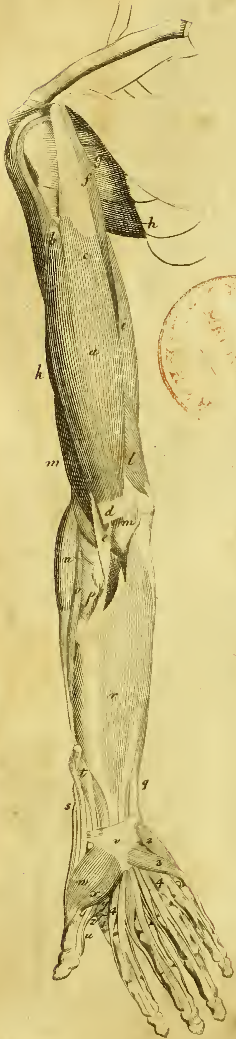
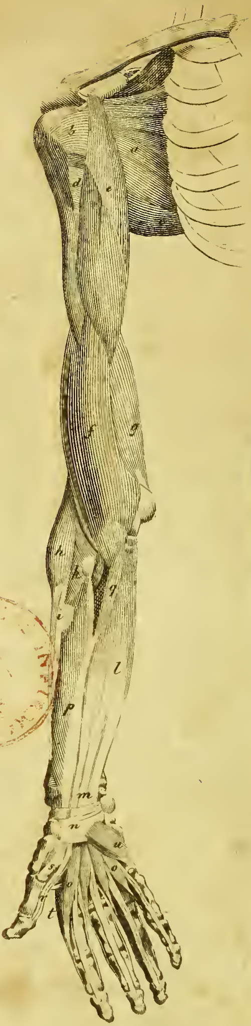


Fig. 3.



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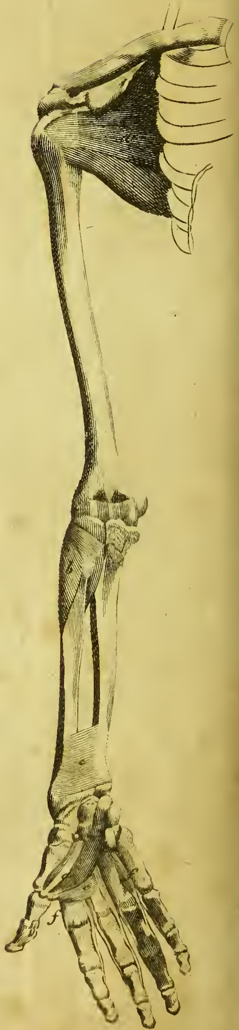


TABLE XII.

REPRESENTS the MUSCLES situated on the Fore Part of the SUPERIOR EXTREMITY.

FIG. 1.

A View of the First Layer of MUSCLES *on the Fore Part of the* SUPERIOR EXTREMITY, *the Integuments and Aponeurosis being removed.*

a, The deltoides.
b, The insertion of the pectoralis major.
c, The biceps flexor cubiti.
d, The aponeurosis of the biceps cut off.
e, The round tendon of the biceps cut off.
f, The long head of the triceps extensor cubiti.
g, *g*, The brachialis internus.
h, The third head of the triceps, called *Brachialis Externus.*
i, The supinator radii longus.
k, The pronator radii teres.
l, The flexor carpi radialis.
m, The palmaris longus.
n, *n*, Part of the flexor digitorum sublimis.
o, The under end of the flexor carpi ulnaris.
p, Part of the flexor longus pollicis.
q, The tendons of the extensores ossis metacarpi et primi internodii pollicis, with their annular ligament.
r, The abductor pollicis, at the outer edge of which is a small portion of the flexor ossis metacarpi pollicis.
s, That portion of the abductor pollicis, called by ALBINUS *Abductor Brevis Alter.*

t, The tendon of the flexor longus pollicis, bound by a ligament.

u, The ligamentum carpi annulare anterius.

v, The aponeurosis palmaris, extending from the annular ligament of the wrist to the transverse ligaments at the roots of the fingers, and the adjacent edges of the metacarpal bones.

w, The palmaris brevis, covering part of the abductor, and flexor parvus minimi digiti.

Upon the fingers are seen the annular ligaments retaining the tendons of the flexor sublimis, and flexor profundus, in their places.

FIG. 2.

The Second Layer of MUSCLES *on the fore Part of the* SUPERIOR EXTREMITY.

a, The biceps flexor cubiti.

b, Its long head.

c, Its short head.

d, A section of the aponeurotic tendon of the biceps.

e, The round tendon of the biceps.

f, Part of the coraco-brachialis.

g, The subscapularis.

h, The teres major.

i, The long head of the triceps extensor cubiti.

k, Its short head.

l, The brachialis externus of the triceps.

m, *m*, The brachialis internus.

n, The extensor carpi radialis longior.

o, The extensor carpi radialis brevior.

p, The supinator radii brevis.

q, The insertion of the flexor carpi ulnaris.

r, The flexor digitorum sublimis; its tendons dividing near their insertion in the second phalanx of the bones of the fingers, for the passage of the tendons of the flexor profundus.

s, The extensor ossis metacarpi, and extensor primi internodii pollicis.

t, Part of the flexor pollicis longus;

u, Its tendon.

v, The ligamentum carpi annulare.

w, The flexor ossis metacarpi pollicis.

x, The abductor pollicis brevis alter of ALBINUS.

y, Part of the flexor brevis pollicis.

z, Part of the adductor pollicis.

1, The abductor indicis.

2, The adductor minimi digiti.

3, The flexor parvus minimi digiti.

4, 4, The four lumbricales.

FIG. 3.

The Third Layer of MUSCLES *on the Fore Part of the* SUPERIOR EXTREMITY.

a, The subscapularis;

b, Its tendon.

c, The teres major;

d, Its tendon.

e, The coraco-brachialis.

f, The brachialis internus.

g, The brachialis externus of the triceps.

h, The extensor carpi radialis longior.

i, Part of the extensor carpi radialis brevior.

k, The supinator radii brevis.

l, The flexor digitorum profundus.

m, The tendons of that muscle passing under the ligamentum carpi annulare, to be inserted into the third phalanx of the fingers.

n, The ligamentum carpi annulare.

o, *o*, The four lumbricales.

p, The flexor longus pollicis.

q, A slip which it sometimes receives from the inner condyle of the os humeri.

r, The tendon of the flexor longus pollicis inserted into the last joint of the thumb.

s, The flexor brevis pollicis.

t, The first interosseous muscle of the fore finger.

u, The adductor minimi digiti.

FIG. 4.

The Fourth Layer of MUSCLES *on the Fore Part of the* SUPERIOR EXTREMITY.

a, The subscapularis.

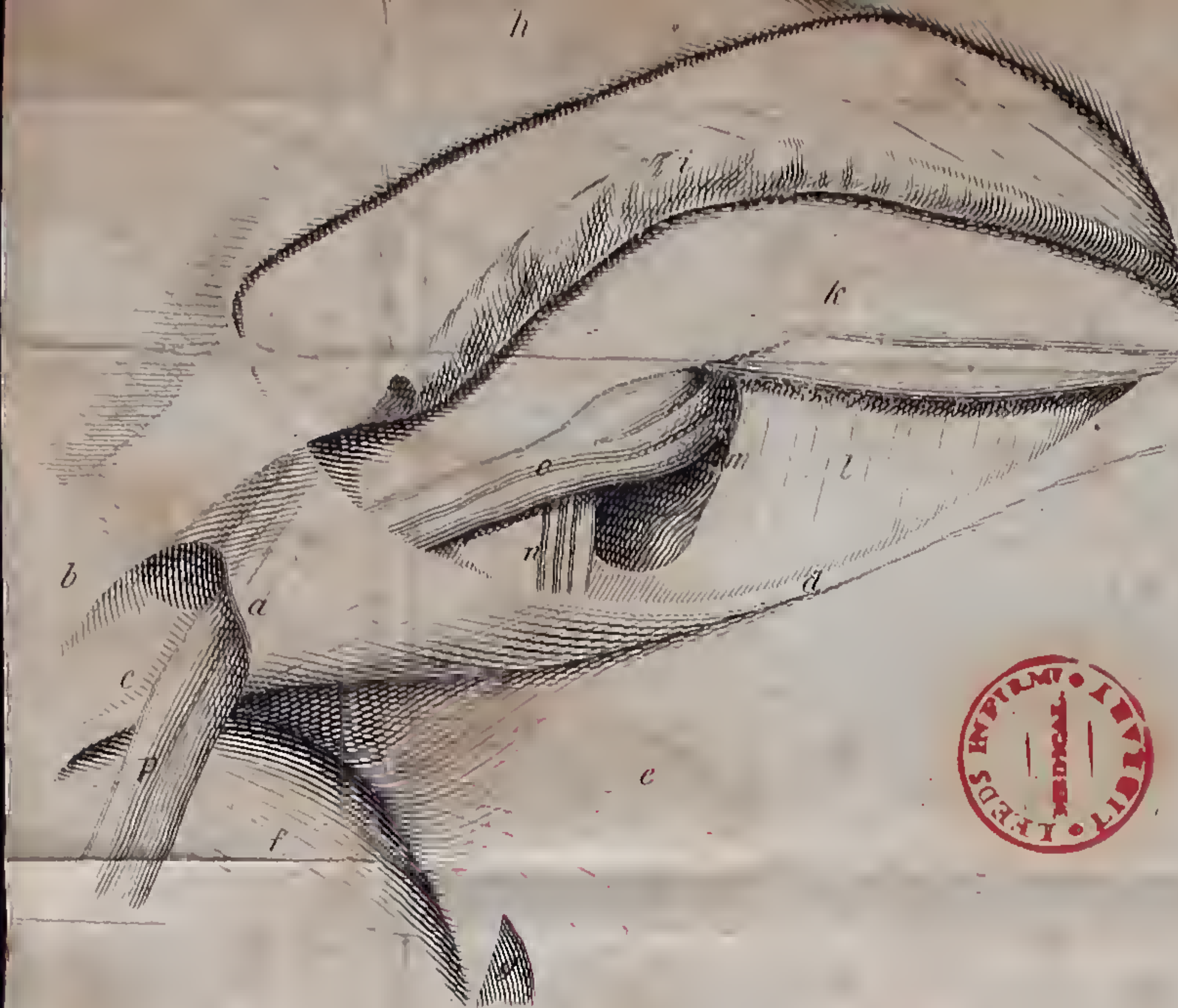
b, The supinator radii brevis.

c, The pronator radii quadratus.

d, The flexor brevis pollicis, with its insertion into the ossa sesamoidea.

e, The adductor pollicis.

f, *f*, The seven interossei,—the first placed at the outer side of the metacarpal bone of the fore-finger,—the rest of them between the metacarpal bones.



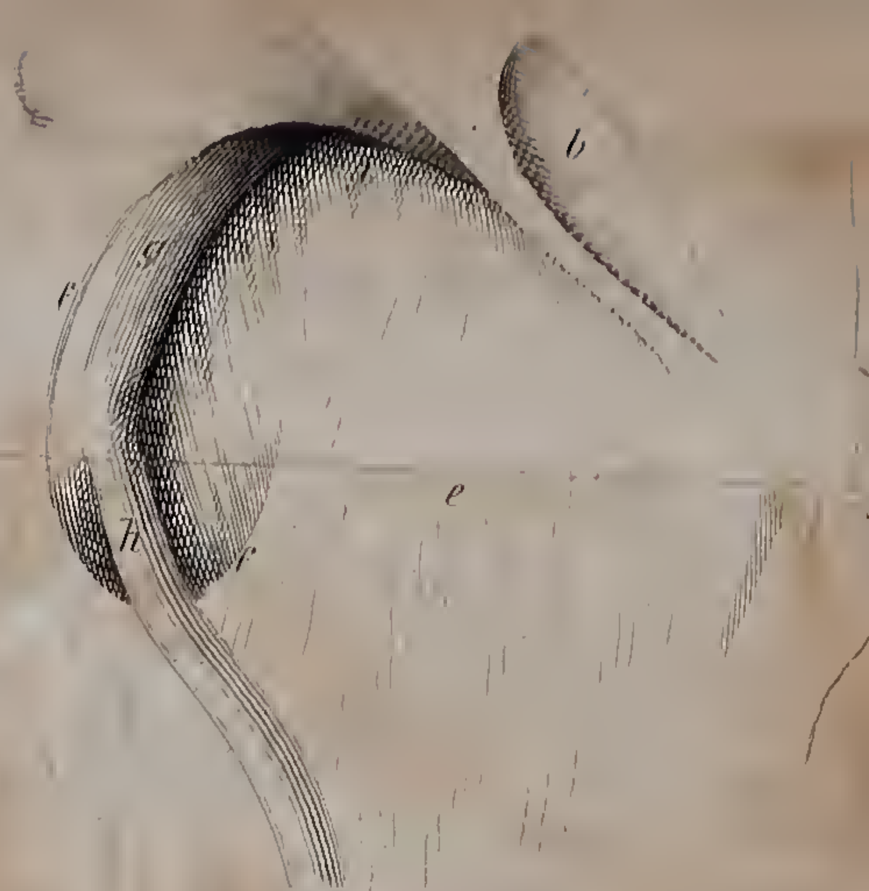


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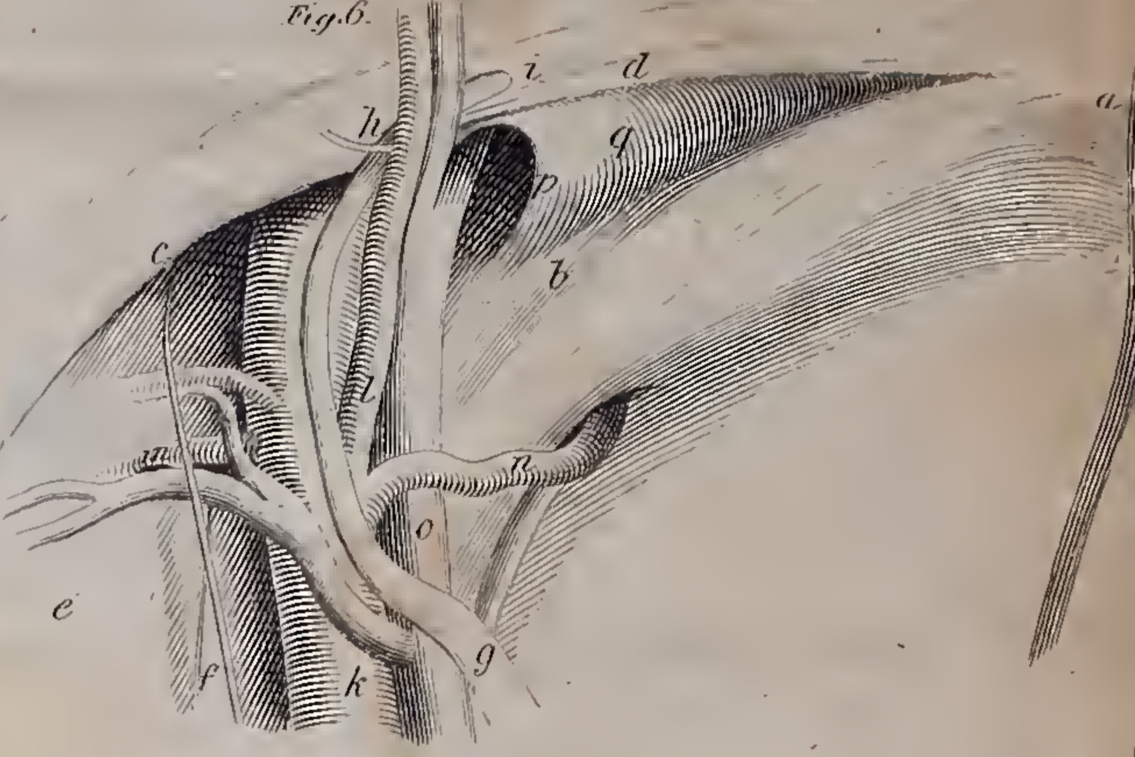
Fig. 6.



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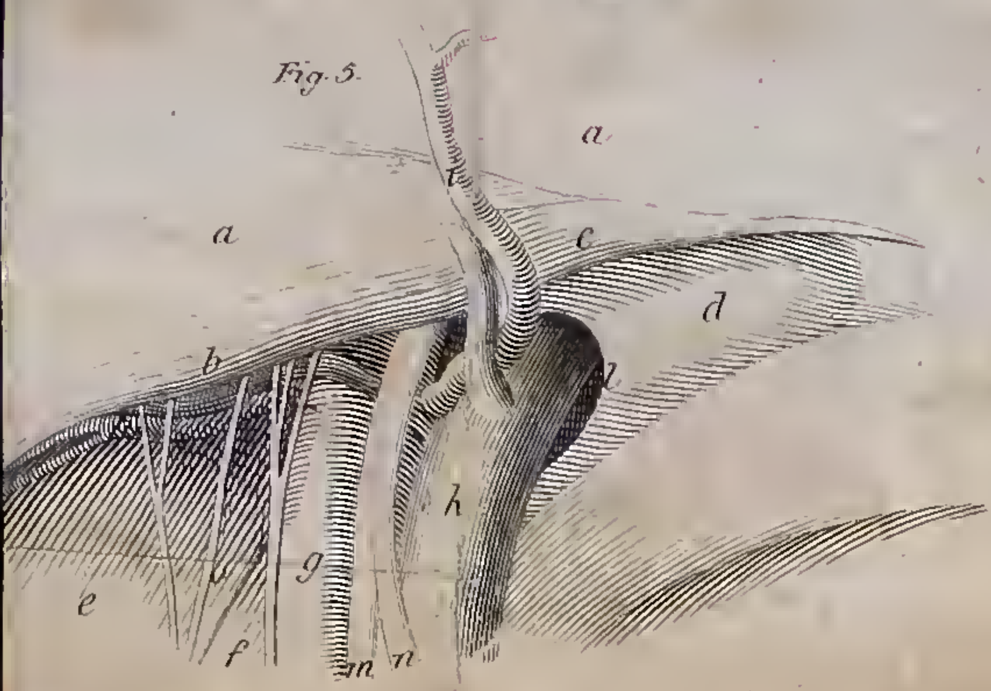

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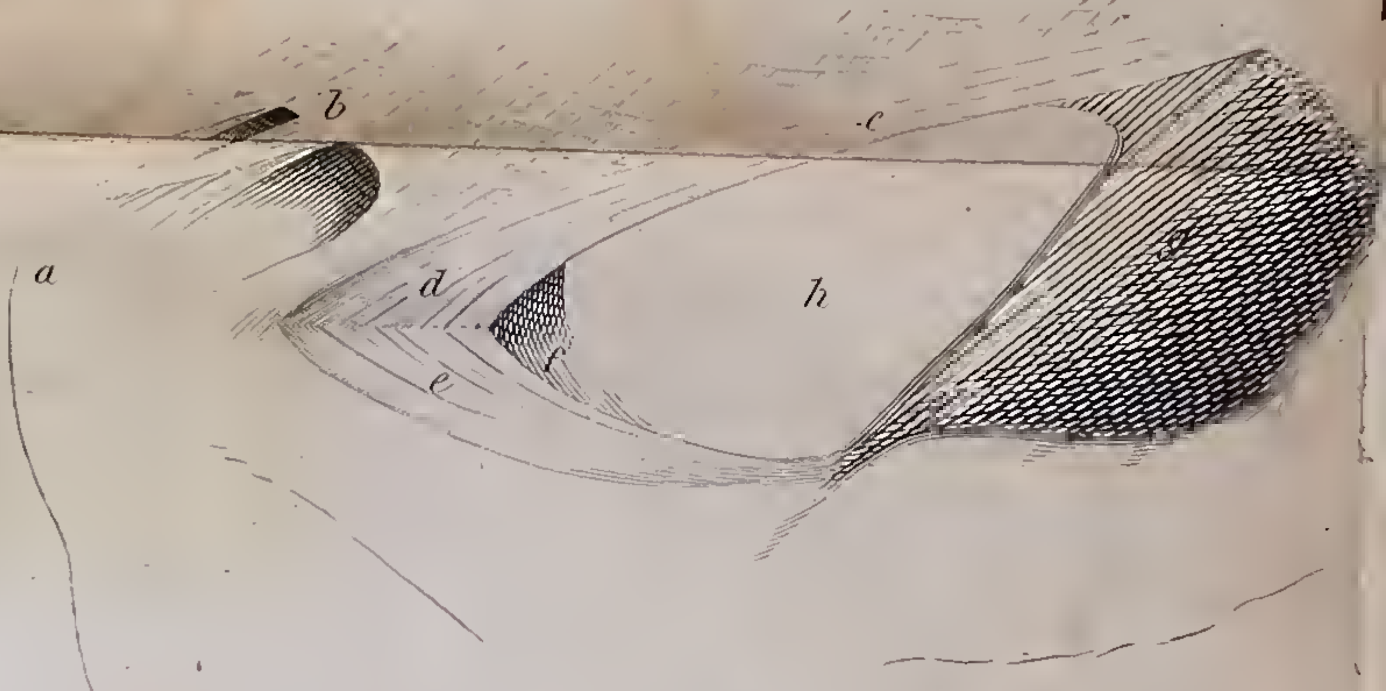

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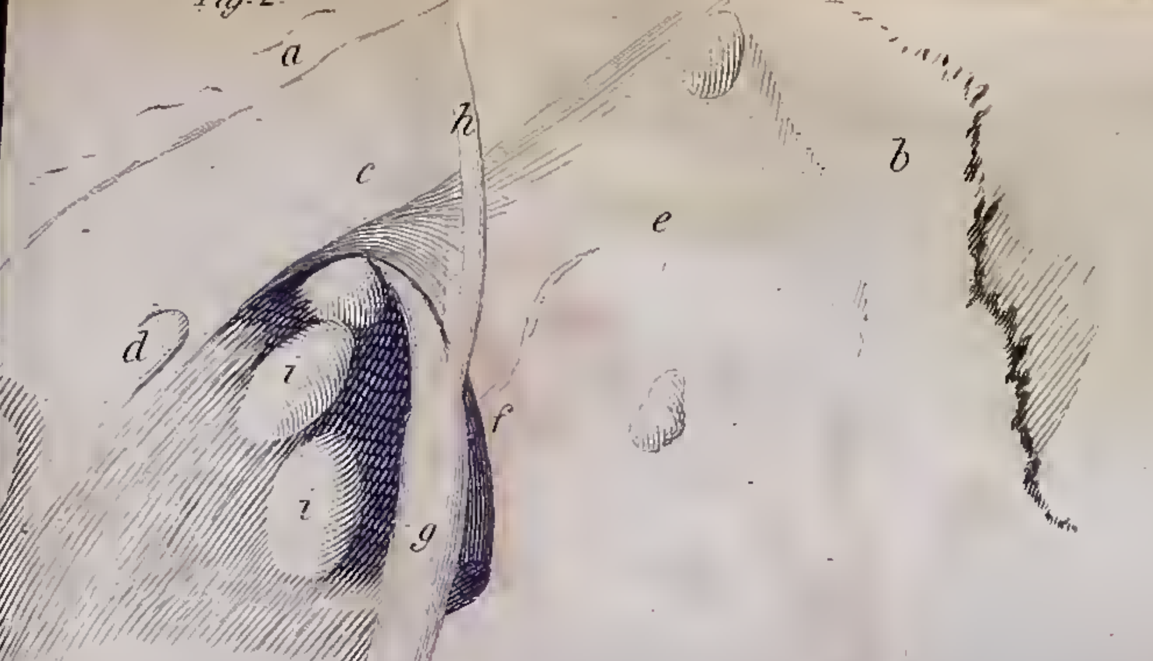

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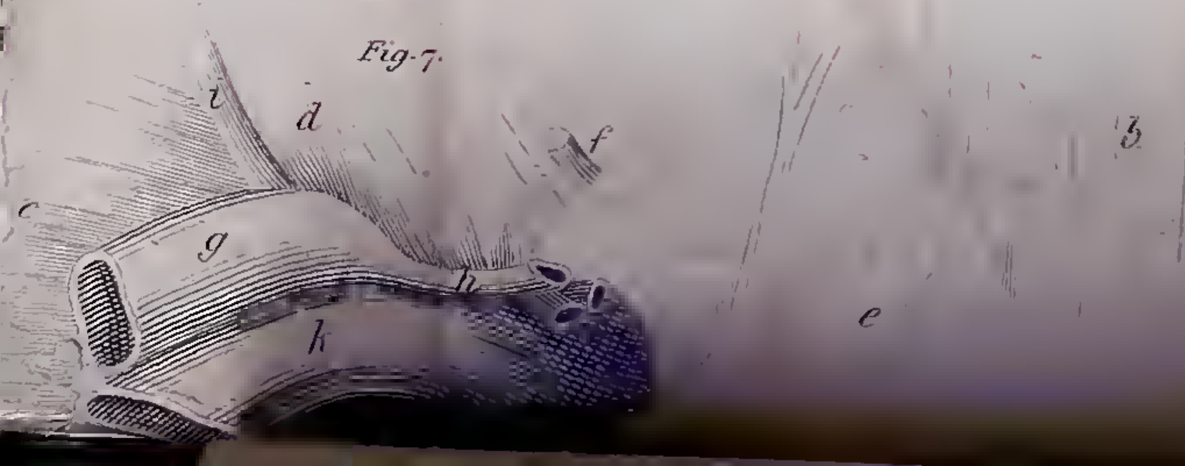
Fig. 7.



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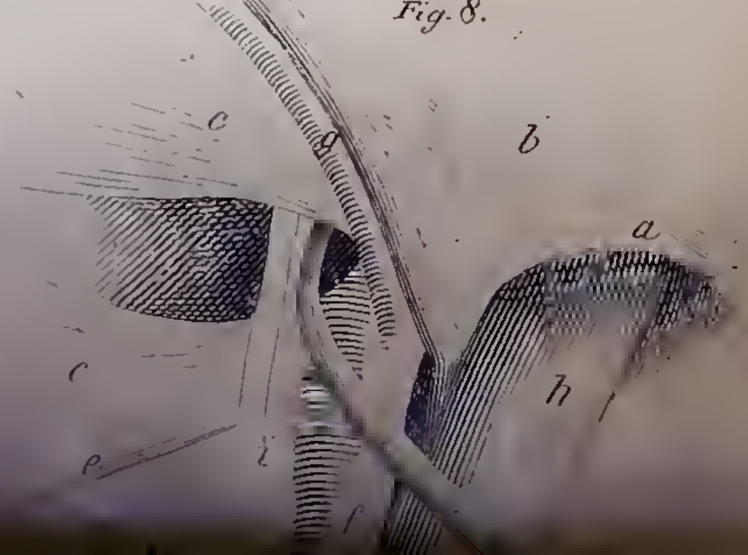

TABLE IXA.

THIS Plate contains the Anatomy of the Parts about the GROIN in both Sexes, or of the Parts concerned in INGUINAL and CRURAL HERNIA.—All the Figures, excepting the Third, belong to the Left Side of the Body.—Fig. 2. 5. 6. are taken by the AUTHOR from Nature.—Fig. 1. 3. 4. 7. 8. are Sketches from the highly finished Work of MR COOPER on Hernia.

FIG. 1.

Shews the Formation of the Abdominal Rings in the Male, the Course of the Spermatic Cord through these, and the Form and Situation of some of the Fasciæ.

a, The external abdominal ring.

b, The upper column of the tendon which assists in the formation of this ring.

c, The under column of this tendon, extending from,

d, The crural arch, or ligament of POUPART, to be fixed to the pubis.

e, The ilial, and,

f, The pubal portion of the fascia lata femoris.

g, The vena saphena perforating the fascia lata, to terminate in the femoral vein.

h, The tendon of the external oblique muscle, cut and reflected, to shew parts deeper seated.

i, The lower edge of the internal oblique muscle, cut from the crural arch, and also reflected.

k, The transversalis, the lower edge of which is cut and turned up.

l, The transverse fascia, running up from the crural arch to line the back part of the transverse muscle and its tendon, thereby preventing crural hernia from happening between the external iliac blood-vessels and the superior-anterior spinous process of the os ilium.

m, The internal abdominal ring.

n, The epigastric blood-vessels, passing first at the inner side of and then behind the spermatic cord.

o, The spermatic cord, descending through the abdominal ring, shewing at the same time the length of the inguinal canal, and the course the bowels take in inguinal hernia.

p, The spermatic cord, in its descent to the testicle.

FIG. 2.

Exhibits a Portion of the Tendinous Fasciæ about the Groin, in the Female.

a, The superficial fascia, which covers the tendon of the external oblique muscles of the abdomen, cut from the ligament of POUPART, and turned up.

b, That part of the superficial fascia, which covers the fascia lata femoris at the upper part of the thigh, cut and turned outwards.

c, The under end of the tendon of the external oblique muscle, forming the ligament of POUPART.

d, The round ligament of the uterus, passing through the external abdominal ring.

e, The fascia lata femoris, descending from the under edge of POUPART's ligament.

f, The crescentic or falciform edge of this fascia.

g, The vena saphena, passing through a notch in the fascia, to terminate in the femoral vein.

h, A vein descending from the integuments of the abdomen, also to terminate in this vein.

i, *i*, Some lymphatic glands situated in the notch at the side of the vena saphena, where crural herniæ happen.

FIG. 3.

Represents the External Abdominal Ring, and the Falciform Ligament, or Semilunar Edge of the Fascia Lata Femoris, in the Female.

a, The symphysis of the pubis.

b, The external abdominal ring, with the upper and under columns by which it is formed.

c, The crural arch.

d, *e*, The fascia lata of the thigh ; *d*, the ilial ; and *e*, the pubal portion of this fascia.

f, *f*, The semilunar or falciform edge of the fascia.

g, The crural sheath.

h, The vena saphena.

i, The place where the bowels protrude in femoral hernia.

FIG. 4.

Shews the Insertions of the Tendon of the External Oblique Muscle into the Os Pubis ; The Iliac Fascia, and the Orifice of the Crural Sheath, in the Female.

a, The pubis.

b, The external abdominal ring, with two orifices in it, which happens occasionally.

c, The anterior surface of the crural arch; above the letter is seen the direction of the fibres of the tendon of the external oblique muscle, and curved tendinous lines decussating that tendon.

d, The third insertion of the tendon of the external oblique muscle, or that part of the tendon which is fixed to the upper part and spine of the pubis.

e, The ligament covering the os pubis, into which the third insertion of this tendon is fixed.

f, A portion of the fascia transversalis, and tendon of the rectus, passing behind the insertion of the external oblique muscle.

g, The fascia iliaca, passing from the crural arch over the internal iliac muscle.

h, The orifice of the crural sheath, for the passage of the femoral blood-vessels and absorbents.

FIG. 5.

Gives a View of the Inner Side of the Crural Arch, and of the Passage of the Blood-Vessels which go under it, in the Male.

a, *a*, The abdominal muscles reflected.

b, *c*, *d*, The posterior, or inner part of the crural arch; *d*, A portion of this arch, forming the third insertion of the external oblique muscle, and which is broader than in the female.

e, The iliac fascia, covering the internal iliac muscle.

f, Part of the large psoas muscle.

g, The external iliac artery, sending off,

h, The internal circumflex artery of the os ilium, and,

i, The epigastric artery.

k, The external iliac vein, receiving the circumflex and epigastric veins.—The circumflex artery and vein are seen in this place where the iliac joins the transverse fascia.

l, The crural ring, where femoral hernia occurs.

m, The spermatic blood-vessels.

n, The vas deferens, departing from the blood-vessels, to get into the pelvis.

FIG. 6.

View of the Inner Side of the Crural Arch in the Female, and Parts somewhat corresponding with those seen in the former Figure.

a, The symphysis of the pubis.

b, The brim of the pelvis.

c, *d*, The crural arch, or ligament of POUPART. The letter *d* is placed on that part of the ligament that is recommended by GIMBERNAT to be cut in crural hernia.

e, The iliac fascia covering the internal iliac muscle.

f, The large psoas muscle, with a branch of the lumbar nerves running along it to the thigh.

g, *h*, *i*, The round ligament of the uterus; *h*, the place where it passes through the fascia transversalis; *i*, the ligament descending towards the groin.

k, The external iliac artery.

l, The epigastric artery.

m, The circumflex artery of the os ilium.

n, The obturator artery, in this subject arising from the external iliac.

o, The external iliac vein, receiving branches corresponding with those sent off from the iliac artery.
p, The crural ring.
q, The third insertion of Poupart's ligament.

FIG. 7.

Sketch of the Inner Side of that Part of the Parietes of the Abdomen, which separates this Cavity from the Thigh, and of the Iliac Blood-vessels passing through the Crural Ring, in the Female.

a, *a*, The symphysis of the pubis.
b, The rectus abdominis, inserted into the symphysis of the pubis.
c, The fascia iliaca.
d, *e*, The fascia transversalis; *e*, that part of it which passes from the pubis to join the tendon of the rectus.
f, The round ligament of the uterus, passing through the fascia transversalis to get into the inguinal canal.
g, The iliac artery.
h, The beginning of the epigastric artery, with its associate vein.
i, The circumflex artery.
k, The iliac vein.
l, The crural space or ring, through which femoral herniæ descend.

FIG. 8.

The Semicircular Insertion of POUPART's *Ligament into the Pubis, forming a Portion of the Crural Ring, in the Male.*

a, That part of POUPART's ligament which forms the crural ring.

b, The tendon of the transversalis inserted into the pubis behind the external abdominal ring, and preventing that opening from being seen.

c, *c*, The fascia transversalis, which here separates, to form the internal abdominal ring.

d, The fascia iliaca.

e, The place where the two fasciæ meet, and shut up the under end of the abdomen.

f, The external iliac artery.

g, The epigastric artery, with the corresponding vein.

h, The external iliac vein.

i, The spermatic artery and vein.

k, The vas deferens.

Fig. 1.

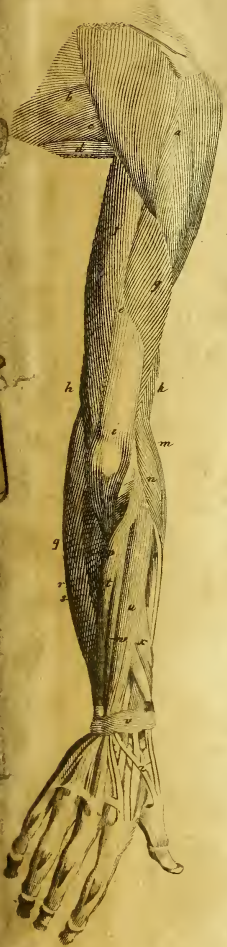

Fig. 3.

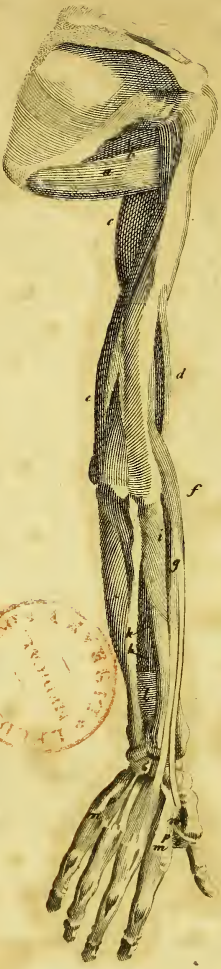

Fig. 2.

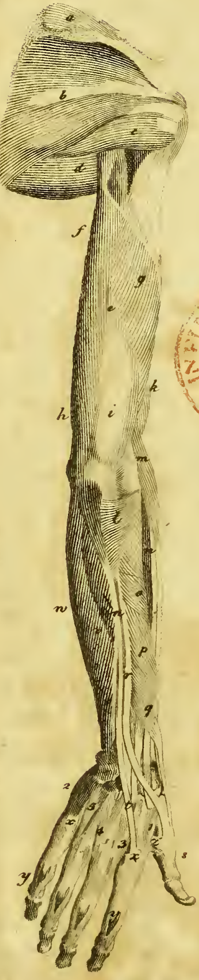

Fig. 4.

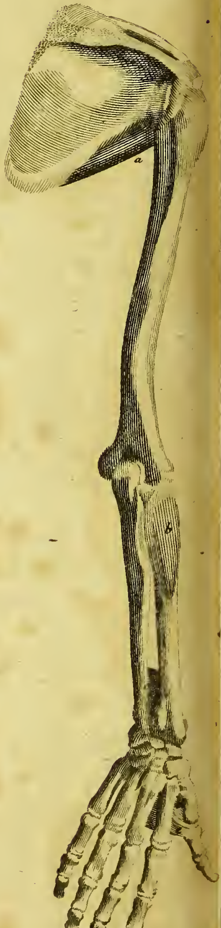

TABLE XIII.

REPRESENTS the MUSCLES on the back part of the SUPERIOR EXTREMITY.

FIG. 1.

A View of the First Layer of MUSCLES *on the Back Part of the* SUPERIOR EXTREMITY.

a, The deltoides, with its insertion into the os humeri.
b, The infra-spinatus.
c, The teres minor.
d, The teres major.
e, The triceps extensor cubiti.
f, The long, and,
g, The short head of the triceps.
h, The third head, called *Brachialis Externus*.
i, The common tendon of the three heads.
k, Part of the brachialis internus.
l, Part of the anconeus.
m, The supinator radii longus.
n, The extensor carpi radialis longior.
o, The extensor carpi radialis brevior.
p, Part of the flexor profundus, which comes from the ulna.
q, Part of the palmaris longus.
r, Part of the flexor digitorum sublimis.
s, The flexor carpi ulnaris.
t, The extensor carpi ulnaris.
u, The extensor digitorum communis, in which are seen,
Its passage under *v*, the ligamentum carpi annulare posterius:
The portion *w*, which it sends to the little finger;

Its flat tendons, running along the metacarpal bones;

The aponeurotic slips, which join these tendons together near the first joint of the fingers;

The tendons upon the back of the fingers, forming broad expansions which cover and adhere to the first and second, and are inserted into the base of the third phalanges;

The splitting and rejoining of the tendons, between the first and second phalanges, for facilitating the motion of the joints.

x, The extensor ossis metacarpi, and, *y*, The extensor primi internodii pollicis, with their annular ligament.

z, The tendon of the extensor secundi internodii pollicis.

FIG. 2.

The Second Layer of MUSCLES *on the Back Part of the* SUPERIOR EXTREMITY.

a, The supra-spinatus.
b, The infra-spinatus.
c, The teres minor.
d, The teres major.
e, The triceps extensor cubiti.
f, Its long head.
g, Its short head.
h, part of the third head, named *Brachialis Externus.*
i, The common tendon of the triceps inserted into the olecranon.
k, Part of the brachialis internus.
l, The anconeus.
m, The extensor carpi radialis longior.
n, The extensor carpi radialis brevior.

o, The supinator radii brevis.

p, The extensor ossis metacarpi pollicis.

q, The extensor primi internodii pollicis.

r, The extensor secundi internodii pollicis.

s, The conjoined tendons of the three extensors of the thumb.

t, The indicator.

u, The flexor digitorum profundus.

v, The flexor carpi ulnaris.

w, A small portion of the flexor sublimis.

x, *x*, The cut tendons of the extensor digitorum communis.

y, *y*, The tendinous slips of the extensor communis, fixed to the second phalanx.

z, The adductor pollicis.

1, The abductor indicis.

2, The abductor minimi digiti.

3, 4, 5, The posterior interossei, consisting of, 3, The prior medii digiti, 4, The posterior medii digiti, and, 5, The posterior annularis.

FIG. 3.

The Third Layer of MUSCLES *upon the Back part of the* SUPERIOR EXTREMITY.

a, The teres major.

b, Part of the subscapularis.

c, Part of the coraco-brachialis.

d, Part of the brachialis internus.

e, The brachialis externus.

f, The extensor carpi radialis longior.

g, The extensor carpi radialis brevior.

h, The flexor profundus perforans.
i, The supinator radii brevis.
k, Part of the flexor longus pollicis.
l, The pronator radii quadratus.
m, *m*, The cut tendons of the extensor digitorum.
n, The flexor brevis pollicis.
o, The adductor pollicis.
p, *p*, The interossei interni, with portions of the interossei externi, the rest of the interossei externi being cut off.

At the lateral parts of the roots of the fingers, in this and the two former figures, are seen the joining of the tendons of the extensor digitorum, and of the lumbricales and interossei.

FIG. 4.

The Fourth Layer of MUSCLES *on the Back Part of the* SUPERIOR EXTREMITY.

a, The subscapularis.
b, The supinator radii brevis.
c, The pronator radii quadratus.
d, The flexor brevis pollicis.
e, The adductor pollicis.

TAB. XIV.

Fig. 1.

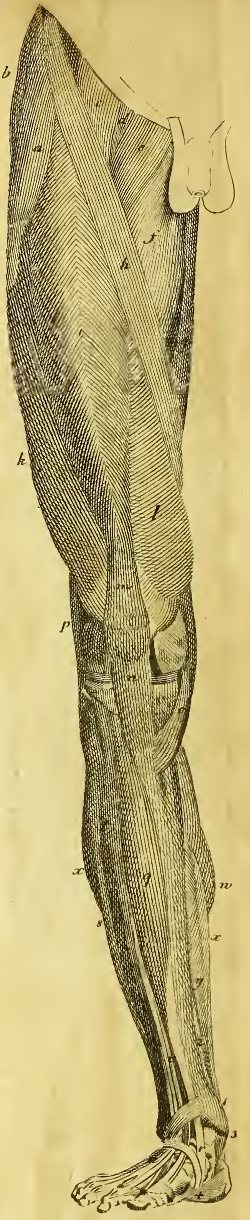

Fig. 2.

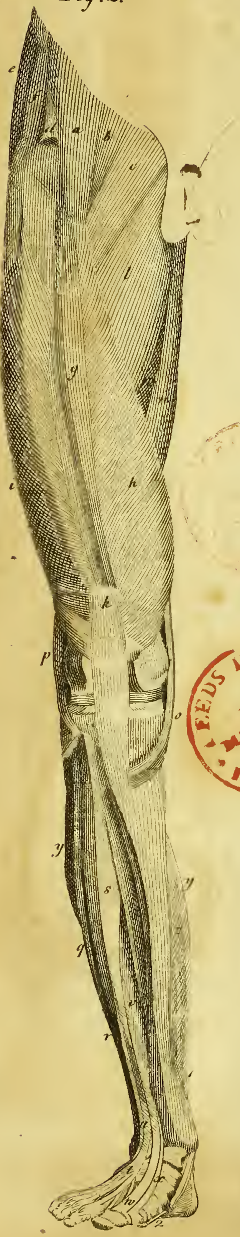

Fig. 3.

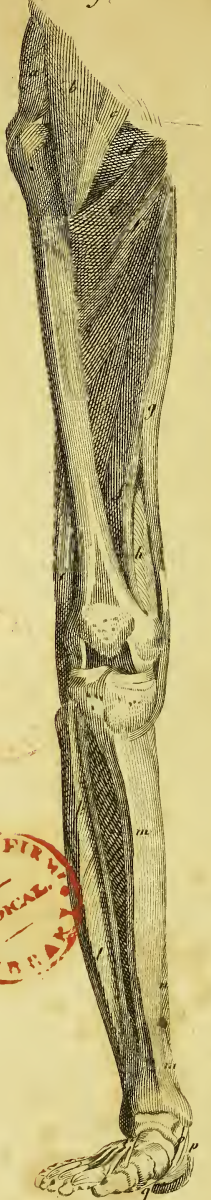

Fig. 4.

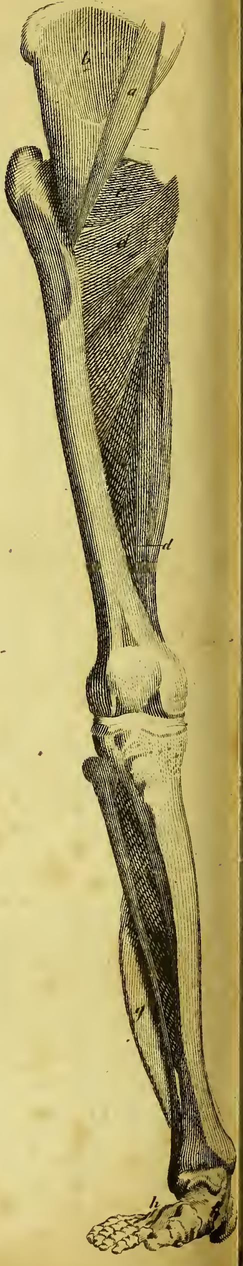

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TABLE XIV.

REPRESENTS the MUSCLES on the Fore Part of the INFERIOR EXTREMITY.

FIG. 1.

The First Layer of MUSCLES *on the Fore Part of the* INFERIOR EXTREMITY.

a, The tensor vaginæ femoris.
b, The anterior edge of the gluteus medius.
c, The under end of the iliacus internus, and of,
d, The psoas magnus.
e, The pectinalis.
f, The adductor longus femoris.
g, The gracilis.
h, The sartorius.
i, The rectus femoris.
k, The vastus externus.
l, The vastus internus.
m, The ligament common to the extensors of the leg, fixed to the patella.
n, The ligament fixing the patella to the tibia.
o, The tendons of the sartorius, gracilis, and semimembranosus.
p, The under end of the biceps flexor cruris.
q, The tibialis anticus;
r, Its tendon.
s, The peroneus longus.
t, The extensor longus digitorum pedis.
u, The tendons of the extensor longus.

v, The extensor proprius pollicis.
w, The gastrocnemius externus.
x, *x*, The gastrocnemius internus.
y, The flexor longus digitorum pedis.
z, The tibialis posticus.
1, The tendo Achillis, and tendon of the plantaris.
2, The upper and under portions of the ligamentum tarsi annulare.
3, Ligaments retaining the tendons at the inner ankle.
4, The abductor pollicis.

FIG. 2.

The Second Layer of Muscles *on the Fore Part of the* Inferior Extremity.

a, The under end of the iliacus internus.
b, The under end of the psoas magnus.
c, The pectinalis.
d, The cut end of the rectus femoris.
e, The anterior edge of the gluteus medius.
f, The gluteus minimus.
g, The cruralis, with its tendinous fascia.
h, The vastus internus.
i, The vastus externus.
k, The cut edge of the rectus fixed to the patella.
l, The adductor longus femoris.
m, A small portion of the adductor magnus.
n, The gracilis.
o, The tendons of the gracilis and semi-tendinosus.
p, The tendon of the biceps flexor cruris.
q, The peroneus longus.
r, The peroneus brevis.

s, The extensor longus digitorum pedis;
t, The tendons of that muscle.
u, The peroneus tertius.
v, The extensor proprius pollicis;
w, Its tendon;
x, A branch of that tendon not constant.
y, *y*, The edges of the gastrocnemius internus.
z, The edge of the flexor longus digitorum pedis.
1, The tendons of the tibialis posticus and flexor longus digitorum.
2, Part of the flexor brevis digitorum.

FIG. 3.

The Third Layer of MUSCLES *on the Fore Part of the* INFERIOR EXTREMITY.

a, The gluteus minimus.
b, The iliacus internus.
c, The psoas magnus.
d, The obturator externus.
e, The adductor brevis.
f, *f*, The adductor magnus.
g, The gracilis.
h, The semi-membranosus, with its insertion in the tibia.
i, The short head of the biceps flexor cruris.
k, The peroneus longus.
l, The peroneus brevis.
m, *m*, The tibialis posticus, the interosseous ligament being removed.
n, The flexor longus digitorum pedis.
o, The tendon of the tibialis posticus.

p, The tendon of the flexor longus digitorum.
q, The tendon of the flexor longus pollicis pedis.
r, The extensor brevis digitorum pedis.

FIG. 4.

The Fourth Layer of MUSCLES *on the Fore Part of the* INFERIOR EXTREMITY.

a, The psoas magnus.
b, The iliacus internus.
c, The obturator externus.
d, *d*, The adductor magnus.
e, The tibialis posticus;
f, Its tendon.
g, The peroneus brevis.
h, The interossei externi.

Tab. XV.

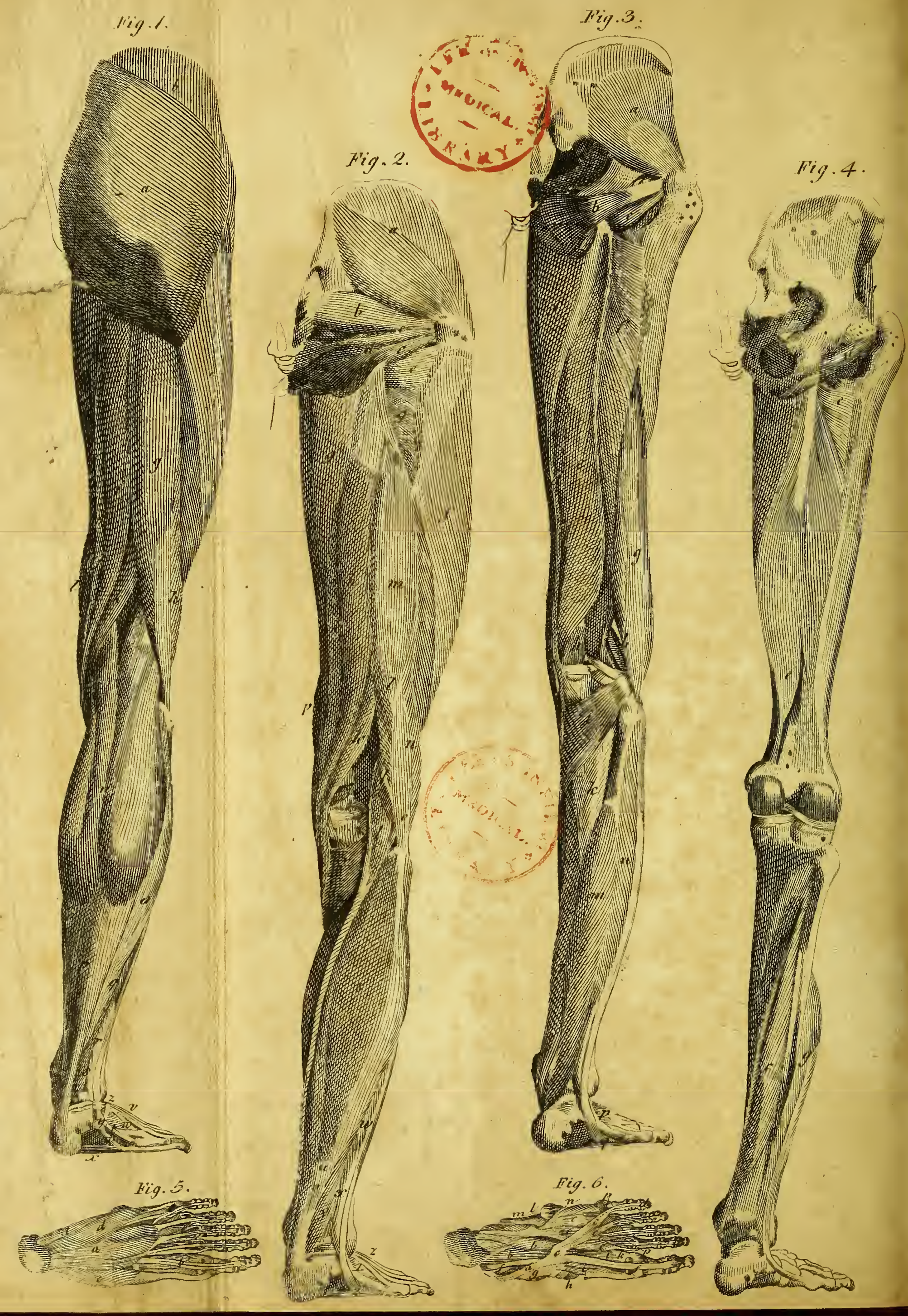

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TABLE XV.

REPRESENTS the MUSCLES situated on the Back Part of the INFERIOR EXTREMITY.

FIG. 1.

A View of the First Layer of MUSCLES *on the Back Part of the* INFERIOR EXTREMITY.

a, The gluteus maximus.
b, Part of the gluteus medius.
c, The vastus externus.
d, Part of the adductor magnus femoris.
e, The gracilis.
f, Part of the sartorius.
g, The long head of the biceps flexor cruris;
h, Its short head.
i, The semi-tendinosus.
k, The semi-membranosus.
l, Part of the vastus internus.
m, The edge of the plantaris.
n, The gastrocnemius externus.
o, *o*, The edge of the gastrocnemius internus.
p, The tendo Achillis.
q, The peroneus longus.
r, The peroneus brevis.
s, The flexor longus pollicis pedis.
t, The tendon of the peroneus brevis.
u, The tendon of the peroneus longus, in its passage to the sole.

v, The tendons of the extensor longus digitorum pedis.
w, The tendon of the peroneus tertius.
x, The abductor minimi digiti pedis.
y, A ligament common to the long and short peronei muscles, and one proper to each of them.
z, The ligamentum tarsi annulare.

FIG. 2.

The Second Layer of Muscles *on the Back Part of the* Inferior Extremity.

a, The gluteus medius.
b, The pyriformis.
c, The gemini.
d, The tendon of the obturator internus passing between the gemini.
e, The quadratus femoris.
f, The vastus externus.
g, The adductor magnus femoris.
h, The semi-tendinosus.
i, The gracilis.
k, The semi-membranosus.
l, The biceps flexor cruris.
m, The long head of the biceps.
n, The short head.
o, The common tendon of the two heads.
p, Part of the vastus internus.
q, *q*, The cut heads of the gastrocnemius externus.
r, The popliteus.
s, The soleus.
t, The plantaris.
u, The cut tendon of the gastrocnemius externus.

v, The tendo Achillis, with the tendon of the plantaris adhering to it.
w, The peroneus longus.
x, The peroneus brevis.
y, The flexor pollicis longus.
z, The tendons of the extensor digitorum longus.
1, The extensor brevis digitorum.
2, The flexor brevis digitorum.

FIG. 3.

The Third Layer of MUSCLES *on the Back Part of the* INFERIOR EXTREMITY.

a, The gluteus minimus.
b, The obturator internus.
c, The tendon of the obturator externus.
d, The gracilis.
e, The semi-membranosus.
f, *f*, The adductor magnus femoris.
g, The short head of the biceps.
h, *h*, The cut heads of the gastrocnemius externus, with a view of the semilunar cartilages.
i, The popliteus.
k, The tibialis posticus.
l, The flexor longus digitorum pedis.
m, The flexor longus pollicis pedis.
n, The peroneus longus, with the passage of its tendon to the sole.
o, The peroneus brevis.
p, The extensor brevis digitorum pedis.
q, The flexor digitorum accessorius.

FIG. 4.

The Fourth Layer of MUSCLES *on the Back Part of the* INFERIOR EXTREMITY.

a, Part of the iliacus internus.
b, Part of the psoas magnus.
c, Their insertion into the trochanter minor.
d, The obturator externus.
e, *e*, The adductor magnus femoris.
f, The tibialis posticus.
g, The peroneus brevis, with the insertion of its tendon.

FIG. 5.

Represents the First Layer of MUSCLES *on the Sole of the Foot, after removing the Common Integuments, the Aponeurosis Plantaris, and the Vaginal Ligaments of the Toes.*

a, The flexor brevis digitorum, the tendons of which are perforated by the tendons of the flexor longus, and inserted into the second phalanx of the four small toes.
b, The tendon of the flexor longus pollicis, at the sides of which the flexor brevis pollicis appears.
c, The abductor pollicis.
d, *d*, The abductor minimi digiti.
e, *e*, The transversalis pedis.

FIG. 6.

The MUSCLES *which appear in the Sole, after those represented in the former Figure have been removed.*

a, The tendon of the flexor longus digitorum.
b, *b*, The flexor digitorum accessorius, with its insertion into the tendon of the flexor longus digitorum.
c, The connection of the flexor longus digitorum and flexor longus pollicis.
d, *d*, The insertion of the tendons of the flexor longus digitorum into the last phalanx of the four small toes.
e, *e*, *e*, *e*, The four lumbricales.
f, *f*, The tendon of the flexor longus pollicis.
g, The insertion of the tibialis posticus.
h, The insertion of the tibialis anticus.
i, *i*, The two portions of the flexor brevis pollicis.
k, A small portion of the adductor pollicis.
l, The insertion of the peroneus brevis.
m, The tendon of the peroneus longus passing to the sole.
n, The flexor brevis minimi digiti.
o, *o*, Two of the interossei, the insertions of which, and of the other interossei, are seen at the lateral parts of the roots of the toes.
p, *p*, The transversalis pedis.